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GLOBAL DATA MONITORING REPORT

March, 1997

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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis. The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background field). Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1-2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Bracknell and assimilated into model runs. Only data from the main hours of 00 UTC, 06 UTC, 12UTC and 18 UTC are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At RSMC Bracknell, for synoptic stations at or below a height of 500 metres, reported mean sea-level pressure is used in the statistics. If this is unavailable the mean sea-level pressure is calculated from the reported station-level pressure and temperature.

For synoptic stations above 500 metres, the mean sea-level pressure is calculated from the reported station-level pressure and temperature, or, if these are not available the height of a standard pressure-level (e.g.: 850 hPa or 700 hPa). If neither of these are available, the reported mean sea-level pressure is used.

Some stations vary their reporting practice according to the observation hour (e.g.: some stations in the CIS report both mean sea-level and station-level pressure at 00 & 12 UTC, but only mean sea-level pressure at 06 & 18 UTC). For monitoring purposes, reported mean sea-level pressure is stored separately from that calculated from station-level pressure or height of a standard pressure-level. Only statistics for the preferred method (see above) are presented in this report, and so for certain high-level stations, such as those from the CIS, approximately half of the number of observations actually received will appear in the statistics.

Aircraft observations

TABLE 4 contains a list of statistics calculated from data received from all airline carriers.

Figure 3 shows 10 degree lat/long box average numbers of AIREP/ASDAR reports received per day throughout the month at Bracknell and assimilated into model runs in the layer 70-500 hPa. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4-7 show wind statistics for AIREP/ASDAR in the layer 70-500 hPa. Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-27 show satellite mean observation-background temperature differences for NOAA-12 soundings at 500 km resolution and figures 28-30 show the same statistics for NOAA-14. Data are plotted where there are > 30 observations in a 10 degree lat/long box.

N.B. 500 km SATEMs are no longer assimilated into the UKMO global Unified Model. Both 500 km and 120 km SATEMs were replaced on 16th April 1996 by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS (from NOAA-12 and NOAA-14).

Figure	Layer (hPa)
25/28	850-1000
26/29	100-300
27/30	30-50

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Bracknell in DRIFTER code during the month for the area
10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics **(Geopotential Height and Windspeed at 100 and 500 hPa)** for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

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Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: BRACKNELL
MONTH: March, 1997

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for ships, fixed buoys and platforms.

Standard of comparison :Background field from Bracknell global model.

Observation times :00, 06, 12, 18 UTC

Elements monitored
:Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (Degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT
:15 hPa (pressure)
:25 m s^{-1} (vector wind)

SELECTION CRITERIA :NOBS ≥ 20 , and one or more of the following:

1.¦bias¦
≥ 4 hPa (pressure),
≥ 5 m s^{-1} (wind speed),
≥ 30 degrees (direction).

2.SD
≥ 6 hPa (pressure),
≥ 80 degrees (direction).

3.PGE ≥ 25

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE									
BOAB	ALL	MSLP	SUR	22	0	0	1.8	-4.5	4.8
C6FA6	ALL	MSLP	SUR	42	0	0	1.1	-6.1	6.2
C6HD5	ALL	MSLP	SUR	24	0	0	0.9	6.4	6.4
C6LI6	ALL	MSLP	SUR	51	0	0	1.3	8.5	8.6
DLDQ	ALL	MSLP	SUR	28	0	0	2.2	-5.0	5.5
ELOC8	ALL	MSLP	SUR	68	1	1	1.6	-4.6	4.9
ELRE5	ALL	MSLP	SUR	66	0	0	1.2	8.9	9.0
EUJV	ALL	MSLP	SUR	35	0	0	1.6	8.1	8.3
KNDM	ALL	MSLP	SUR	20	1	5	4.5	6.6	8.0
LAVV4	ALL	MSLP	SUR	31	0	0	1.5	-5.4	5.7
LAXS2	ALL	MSLP	SUR	84	0	0	1.4	6.3	6.4
NAMW	ALL	MSLP	SUR	28	0	0	1.5	4.9	5.1
NODU	ALL	MSLP	SUR	22	2	9	6.4	1.2	6.5
OZBW6	ALL	MSLP	SUR	69	2	3	1.2	4.9	5.1
ULCI	ALL	MSLP	SUR	23	12	52	2.7	-4.7	5.4
UVGF	ALL	MSLP	SUR	42	26	62	3.1	-0.9	3.3
VRUR6	ALL	MSLP	SUR	34	0	0	1.3	4.7	4.9
VVJS	ALL	MSLP	SUR	36	2	6	1.0	-5.0	5.1
YLBF	ALL	MSLP	SUR	22	0	0	1.1	6.0	6.1
3EIY6	ALL	MSLP	SUR	23	2	9	1.6	10.3	10.5
3FAQ3	ALL	MSLP	SUR	20	0	0	2.0	6.3	6.6
3FTJ4	ALL	MSLP	SUR	31	0	0	1.4	9.5	9.6
3FZW	ALL	MSLP	SUR	29	0	0	1.2	6.3	6.4
62402	ALL	MSLP	SUR	24	0	0	1.8	5.1	5.4
9VHU	ALL	MSLP	SUR	23	0	0	1.2	5.6	5.8
9VIH	ALL	MSLP	SUR	57	0	0	1.6	-4.6	4.9
9VMP	ALL	MSLP	SUR	21	2	10	2.8	4.4	5.2
WIND SPEED									
C6MQ2	ALL	SPEED	SUR	25	0	0	2.6	5.0	5.6
DYZJ	ALL	SPEED	SUR	94	1	1	6.1	7.4	9.6
ELAX2	ALL	SPEED	SUR	45	0	0	2.5	5.7	6.2
ELFO3	ALL	SPEED	SUR	29	0	0	4.8	5.0	6.9
ELHR9	ALL	SPEED	SUR	44	0	0	3.6	5.3	6.4
ELIS8	ALL	SPEED	SUR	33	0	0	5.3	6.9	8.7
FNQM	ALL	SPEED	SUR	53	1	2	5.9	8.8	10.6
GHMA	ALL	SPEED	SUR	48	0	0	4.2	-6.1	7.4
JPAZ	ALL	SPEED	SUR	23	0	0	4.5	5.4	7.0
LAVX4	ALL	SPEED	SUR	22	1	5	5.7	6.1	8.3
OXSF2	ALL	SPEED	SUR	20	0	0	4.0	5.0	6.4
PCVX	ALL	SPEED	SUR	37	1	3	7.2	5.3	8.9
PGWY	ALL	SPEED	SUR	49	0	0	6.2	6.6	9.1
PJOY	ALL	SPEED	SUR	59	0	0	5.1	9.3	10.6
PJVY	ALL	SPEED	SUR	23	0	0	5.5	6.5	8.5
SKPE	ALL	SPEED	SUR	26	1	4	6.5	8.0	10.3
UAHV	ALL	SPEED	SUR	36	0	0	3.6	6.8	7.7
VRVI3	ALL	SPEED	SUR	25	0	0	2.9	5.4	6.1
YJQK4	ALL	SPEED	SUR	40	0	0	6.7	9.1	11.3
ZCAZ7	ALL	SPEED	SUR	30	0	0	3.7	5.3	6.5
ZMFR	ALL	SPEED	SUR	87	0	0	3.7	5.5	6.6
3EOK8	ALL	SPEED	SUR	21	0	0	3.8	5.1	6.3
9MBK	ALL	SPEED	SUR	26	0	0	4.8	5.7	7.5
9MBK8	ALL	SPEED	SUR	43	1	2	5.6	7.7	9.5
WIND DIRECTION									
ELGH5	ALL	DIRN.	SUR	24	0	0	38.5	39.6	55.2
P3XC5	ALL	DIRN.	SUR	35	0	0	52.8	-75.1	91.8
VNGL	ALL	DIRN.	SUR	20	0	0	52.6	-30.7	60.9
32304	ALL	DIRN.	SUR	43	0	0	87.2	29.2	92.0
51310	ALL	DIRN.	SUR	75	0	0	44.4	-34.2	56.0
52313	ALL	DIRN.	SUR	61	0	0	39.3	-31.1	50.1
52318	ALL	DIRN.	SUR	33	0	0	44.5	-40.6	60.2
62106	ALL	DIRN.	SUR	62	1	2	65.0	-31.3	72.2
9VIW	ALL	DIRN.	SUR	25	0	0	88.9	-7.0	89.2

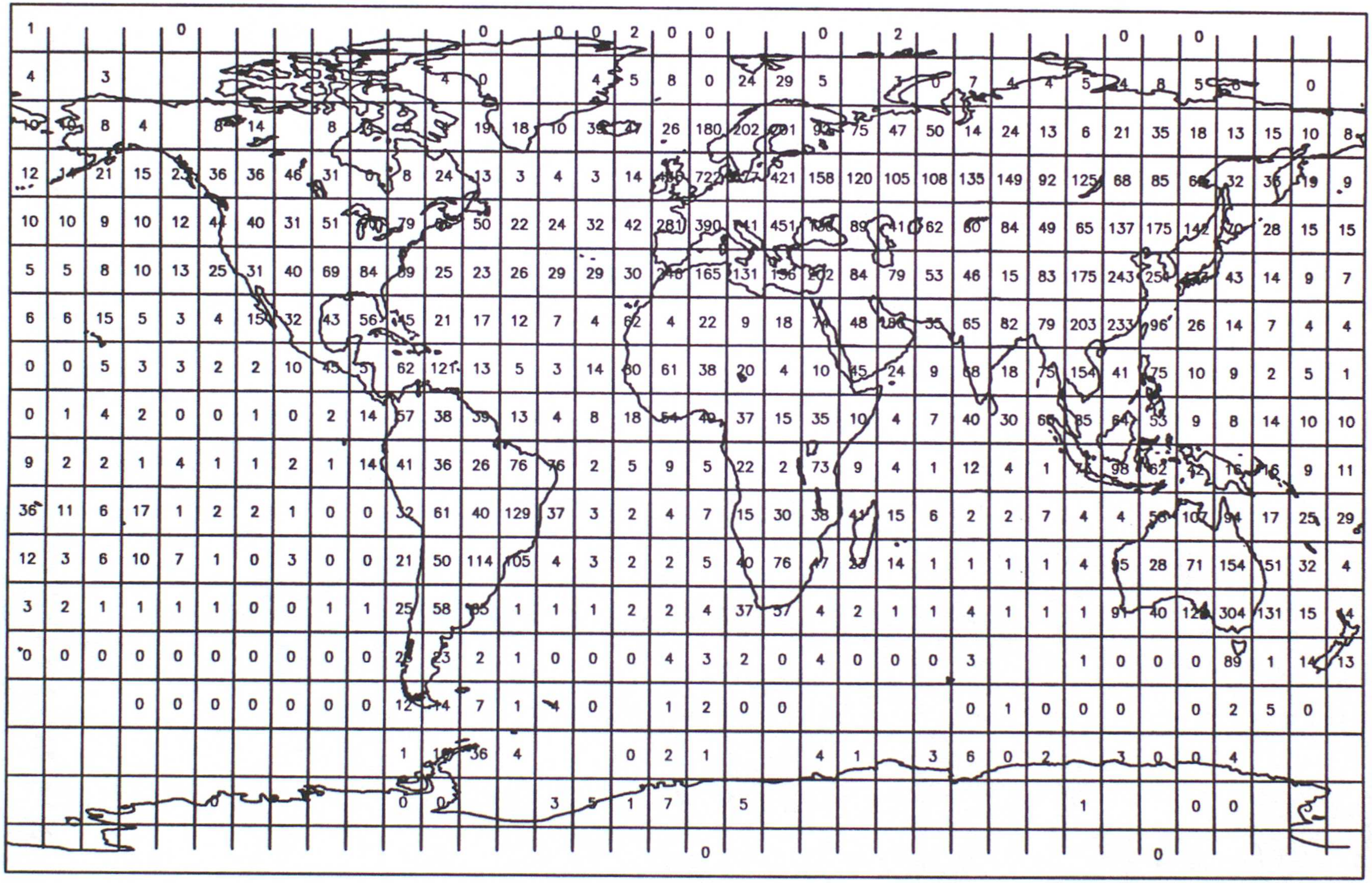
AVAILABILITY – SHIP/SYNOP – MARCH 1997

MAIN HOURS ONLY

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 18993

FIGURE 1



1				0								0		0	0	2	0	0			0		2						0		0				
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36	11	6	17	1	2	2	1	0	0	32	61	40	129	37	3	2	4	7	15	30	38	41	15	6	2	2	7	4	4	56	107	94	17	25	29
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			0	0	0	0	0	0	0	12	14	7	1	4	0		1	2	0	0					0	1	0	0	0		0	2	5	0	
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					0					0	0			3	5	1	7		5									1			0	0		3	
																		0												0					

TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: BRACKNELL
MONTH: March, 1997

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoys.

Standard of comparison :Background field from Bracknell global model.

Position :Average latitude and longitude for period.

Observation times :00, 06, 12, 18 UTC

Elements monitored :Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT :15 hPa (pressure)
:25 m s^{-1} (vector wind)

SELECTION CRITERIA : NOBS ≥ 20 , and one or more of the following:

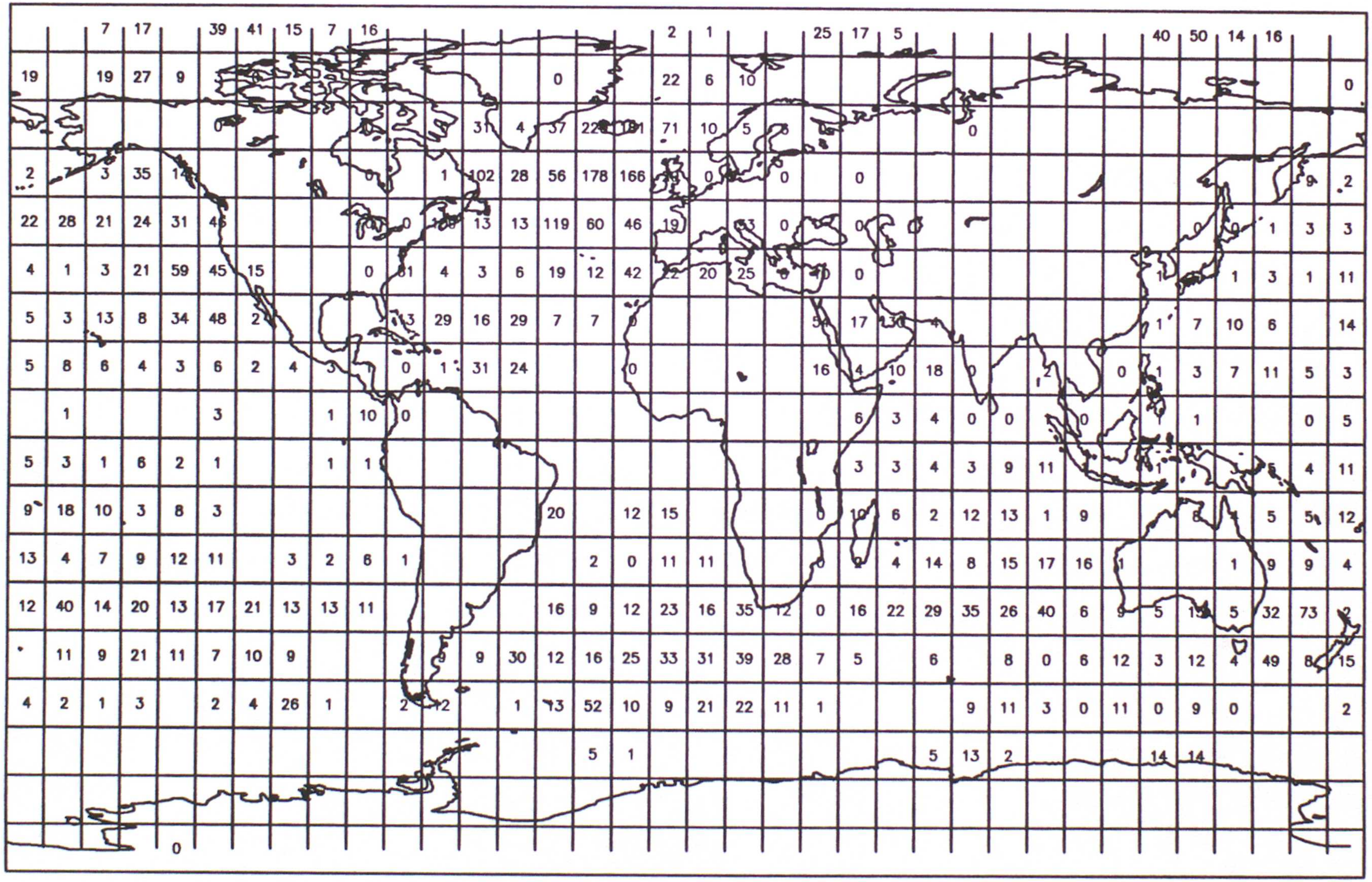
1.$\lvert bias \rvert$	$\geq$ 4 hPa	(pressure),
	$\geq$ 5 m s^{-1}	(wind speed),
	$\geq$ 30 degrees	(direction).
2.SD	$\geq$ 6 hPa	(pressure),
	$\geq$ 80 degrees	(direction).
3.PGE	$\geq$ 25.	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
23505	15.3	57.3	ALL	MSLP	SUR	59	59	100	0.0	0.0	0.0
23512	15.0	67.0	ALL	MSLP	SUR	33	9	27	8.4	-1.5	8.5
23513	10.0	56.8	ALL	MSLP	SUR	114	16	14	7.0	1.8	7.2
23519	20.1	61.8	ALL	MSLP	SUR	21	0	0	6.9	3.8	7.8
23950	5.4	95.9	ALL	MSLP	SUR	22	0	0	2.1	-10.4	10.7
25541	37.5	-123.2	ALL	MSLP	SUR	92	92	100	0.0	0.0	0.0
33573	-47.8	-43.3	ALL	MSLP	SUR	89	55	62	7.6	-1.8	7.8
33575	-41.2	-28.9	ALL	MSLP	SUR	86	57	66	2.0	-12.2	12.4
44601	48.2	-40.7	ALL	MSLP	SUR	134	25	19	7.0	-1.2	7.1
44763	64.1	-21.5	ALL	MSLP	SUR	595	1	0	3.5	-4.4	5.6
46519	32.7	-117.0	ALL	MSLP	SUR	250	194	78	4.3	-12.5	13.2
54901	-40.7	-166.2	ALL	MSLP	SUR	65	0	0	2.9	4.2	5.0
55905	-43.3	145.0	ALL	MSLP	SUR	76	39	51	0.9	-13.6	13.6
64517	74.6	-5.4	ALL	MSLP	SUR	495	65	13	6.1	-2.9	6.7
WIND SPEED											
62803	57.3	-22.0	ALL	SPEED	SUR	700	3	0	5.3	-6.6	8.5
WIND DIRECTION											
44513	48.3	-26.8	ALL	DIRN.	SUR	222	0	0	90.8	-48.4	102.9
56534	-18.1	109.6	ALL	DIRN.	SUR	184	0	0	69.9	57.7	90.6

AVAILABILITY – DRIFTER – MARCH 1997
MAIN HOURS ONLY
10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS
GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 4992

FIGURE 2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2 7 3 35 14 0 1 102 28 56 178 166 0 0 0 9 2
22 28 21 24 31 46 0 0 13 13 119 60 46 19 33 0 0 0 0 1 3 3
4 1 3 21 59 45 15 0 81 4 3 6 19 12 42 22 20 25 0 0 1 1 3 1 11
5 3 13 8 34 48 2 13 29 16 29 7 7 0 54 17 130 4 1 7 10 6 14
5 8 6 4 3 6 2 4 3 1 0 1 31 24 0 16 4 10 18 0 2 0 1 3 7 11 5 3
1 3 1 10 0 6 3 4 0 0 0 1 1 0 5
5 3 1 6 2 1 1 1 3 3 4 3 9 11 1 5 4 11
9 18 10 3 8 3 20 12 15 0 10 6 2 12 13 1 9 8 4 5 5 12
13 4 7 9 12 11 3 2 6 1 2 0 11 11 0 2 4 14 8 15 17 16 1 1 9 9 4
12 40 14 20 13 17 21 13 13 11 16 9 12 23 16 35 12 0 16 22 29 35 26 40 6 9 5 13 5 32 73 2
11 9 21 11 7 10 9 9 9 30 12 16 25 33 31 39 28 7 5 6 8 0 6 12 3 12 4 49 8 15
4 2 1 3 2 4 26 1 2 12 1 13 52 10 9 21 22 11 1 9 11 3 0 11 0 9 0 2
5 1 5 13 2 14 14
0

TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: BRACKNELL
MONTH: March, 1997

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Mean sea level pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1.¦bias¦	≥ 4 hPa
	2. SD	≥ 6 hPa
	3.PGE	≥ 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60445	36.2N	5.4E	1081	S8	117	3	3	0	0.9	4.8	4.9
60468	35.6N	6.2E	1052	S8	116	116	100	0	0.0	0.0	0.0
60511	35.3N	1.4E	1127	S8	116	116	100	0	0.0	0.0	0.0
60535	34.7N	3.3E	1144	S8	86	1	1	0	0.7	-6.7	6.7
60571	31.6N	2.2W	773	S8	120	1	1	0	0.9	-4.5	4.6
60670	24.6N	9.5E	1054	S8	105	3	3	39	1.5	8.2	8.3
63330	13.5N	39.5E	2212	MS	32	1	3	0	1.1	-5.7	5.8
63333	11.1N	39.7E	1916	MS	48	2	4	0	0.9	7.0	7.1
63402	7.7N	36.8E	1577	MS	27	0	0	0	0.8	-10.5	10.5
63451	8.7N	39.0E	1876	MS	27	0	0	4	1.5	-4.9	5.1
63453	8.8N	39.8E	1062	S	26	0	0	0	1.2	12.0	12.1
63478	5.1N	44.6E	320	MS	34	0	0	3	2.0	6.9	7.2
68014	19.6S	18.1E	1411	S8	89	0	0	84	1.4	-5.7	5.9
68396	26.5S	31.3E	641	S8	51	1	2	2	1.2	4.4	4.6
68442	29.1S	26.3E	1354	S8	96	0	0	0	0.9	-5.0	5.1
68488	28.4S	31.1E	1279	S8	68	68	100	0	0.0	0.0	0.0
68752	32.8S	27.4E	524	S8	76	0	0	0	1.0	-7.9	8.0

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
24382	66.4N	143.2E	196	MS	62	0	0	15	3.3	4.3	5.4
24671	63.9N	135.9E	402	MS	84	1	1	10	3.3	6.4	7.2
28984	52.9N	70.2E	395	MS	120	15	13	61	3.4	9.4	10.0
30320	56.9N	105.7E	669	MS	57	57	100	0	0.0	0.0	0.0
30549	54.2N	112.0E	1302	S8	47	3	6	17	3.8	-4.0	5.5
30554	54.5N	113.6E	995	MS	58	0	0	34	2.1	9.7	9.9
31253	54.7N	128.9E	357	MS	121	0	0	8	2.5	-4.5	5.1
35173	51.6N	69.8E	620	MS	61	61	100	0	0.0	0.0	0.0
40701	39.3N	44.4E	1470	MS	73	1	1	1	1.4	7.4	7.5
40743	36.2N	57.7E	941	MS	115	0	0	17	1.4	-5.3	5.5
40762	35.3N	59.2E	1333	MS	112	47	42	0	0.9	-13.6	13.6
40763	35.2N	58.5E	1060	MS	40	0	0	0	1.7	-6.0	6.2
40783	32.4N	49.7E	1972	MS	61	3	5	3	1.6	-7.3	7.5
40789	33.8N	55.1E	921	MS	67	1	1	0	1.5	8.7	8.8
40798	32.3N	50.9E	1991	MS	71	0	0	0	1.2	-8.8	8.9
40818	31.2N	52.7E	2004	MS	72	1	1	8	1.8	-4.3	4.7
40836	30.8N	51.7E	1880	MS	72	6	8	4	1.6	8.9	9.0
40859	29.0N	53.7E	1383	MS	60	1	2	0	1.5	9.1	9.2
41254	23.1N	57.7E	1755	S8	90	90	100	0	0.0	0.0	0.0
41466	13.7N	44.1E	1385	8	20	0	0	5	2.5	-6.0	6.5
44212	50.0N	92.1E	939	MS	81	1	1	15	2.3	5.5	6.0
44477	27.0N	87.4E	1445	S8	76	76	100	0	0.0	0.0	0.0
47022	40.8N	128.2E	1206	S	104	2	2	58	1.3	4.5	4.7
52602	38.8N	93.4E	2734	S	124	0	0	0	1.9	-6.0	6.3
52866	36.6N	101.8E	2262	S	123	1	1	0	1.5	-4.4	4.6
56021	34.1N	95.8E	4176	S	124	0	0	10	1.4	-4.0	4.2
56444	28.5N	98.9E	3488	S	124	124	100	0	0.0	0.0	0.0
56462	29.0N	101.5E	2994	S	113	0	0	1	2.4	7.9	8.3

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80099	7.1N	70.7W	128	M	22	0	0	0	0.7	-6.0	6.0
80431	9.9N	67.3W	429	MS	104	1	1	27	1.3	-4.2	4.4
82704	7.6S	72.7W	170	MS	84	0	0	0	2.2	-4.4	4.9
82975	9.1S	44.1W	331	MS	66	0	0	0	1.3	4.3	4.5
83214	10.3S	54.9W	285	MS	50	0	0	4	2.5	-6.1	6.6

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
83235	12.4S	46.4W	660	MS	81	0	0	4	1.7	6.8	7.0
83295	13.4S	39.9W	755	MS	34	0	0	71	0.9	-4.1	4.2
83319	14.7S	52.4W	315	MS	59	0	0	2	1.7	-4.6	4.9
83332	14.1S	46.4W	950	MS	84	16	19	0	0.8	13.6	13.6
83408	14.3S	43.8W	556	MS	73	2	3	1	1.2	10.6	10.7
83423	16.7S	49.3W	729	MS	87	0	0	0	1.1	-5.8	5.9
83488	17.8S	42.9W	1097	MS	84	84	100	0	0.0	0.0	0.0
83531	18.6S	46.5W	896	MS	79	0	0	0	0.9	-6.6	6.7
83538	18.2S	43.6W	1297	S	77	1	1	1	1.0	-11.4	11.4
83587	19.9S	43.9W	850	MS	79	0	0	0	0.9	-8.1	8.1
83689	21.3S	43.8W	1171	S	50	1	2	0	0.7	4.4	4.5
83704	22.3S	53.9W	369	MS	72	0	0	42	4.4	-7.2	8.4
83773	23.1S	48.9W	793	MS	47	1	2	2	1.2	-5.4	5.5
83836	25.5S	50.6W	837	MS	80	0	0	0	1.0	-4.4	4.5
83916	28.2S	51.5W	806	MS	76	1	1	1	0.9	-4.4	4.5
84425	5.9S	76.1W	184	MS	73	0	0	11	2.5	4.5	5.1
84455	6.5S	76.4W	282	MS	70	0	0	1	2.1	7.0	7.3
84472	7.1S	78.5W	2622	S	55	1	2	2	1.2	-6.8	6.9
84542	9.4S	77.6W	2760	S	43	0	0	0	1.5	4.5	4.7
84686	13.6S	72.0W	3249	S	111	0	0	5	1.9	-5.7	6.0
84782	18.1S	70.3W	469	MS	103	0	0	0	2.0	7.4	7.7
85406	18.3S	70.3W	58	M	120	0	0	5	1.9	5.7	6.0

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
71094	66.7N	61.4W	722	MS	123	0	0	19	2.3	-4.4	5.0
71917	80.0N	85.9W	10	MS	124	1	1	15	3.7	4.9	6.1
76539	22.1N	101.0W	1870	MS	69	0	0	0	1.0	-4.4	4.5
76625	20.6N	100.4W	1813	MS	61	0	0	2	1.3	-8.1	8.2
76632	20.1N	98.7W	2417	MS	22	0	0	95	1.1	-5.5	5.6
76634	20.1N	98.4W	2135	MS	59	1	2	90	1.5	-5.5	5.7
76658	19.2N	103.7W	494	MS	23	0	0	4	1.7	5.7	5.9
76698	19.6N	88.0W	20	MS	53	0	0	2	1.7	-6.0	6.2
76750	18.5N	88.3W	9	MS	66	0	0	0	1.1	-4.2	4.3
76762	17.5N	99.5W	1865	MS	40	40	100	0	0.0	0.0	0.0

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
91339	5.5N	153.8E	3	MS	36	0	0	11	2.5	-5.1	5.7
94955	41.6S	145.7E	684	MS	209	209	100	0	0.0	0.0	0.0

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
02045	67.8N	20.4E	408	M	67	67	100	0	0.0	0.0	0.0
11024	48.4N	15.4E	860	S8	117	8	7	0	0.8	-13.6	13.6
16020	46.5N	11.3E	1461	MS	114	114	100	0	0.0	0.0	0.0
16227	41.9N	13.6E	655	MS	121	112	93	0	0.8	-13.7	13.7
16549	39.1N	8.3E	12	MS	121	0	0	0	1.0	-4.9	5.0
16614	40.4N	21.3E	604	MS	111	2	2	9	1.3	-7.2	7.3

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89744	74.0S	43.0E	3353	S	83	0	0	0	1.9	6.6	6.9
89860	74.2S	160.3E	1772	M	81	0	0	2	2.7	-5.5	6.1

TABLE 4

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: March, 1997

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from Bracknell global model.

Observation times :All hours combined.

Level(s) monitored :70.0 - 500.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

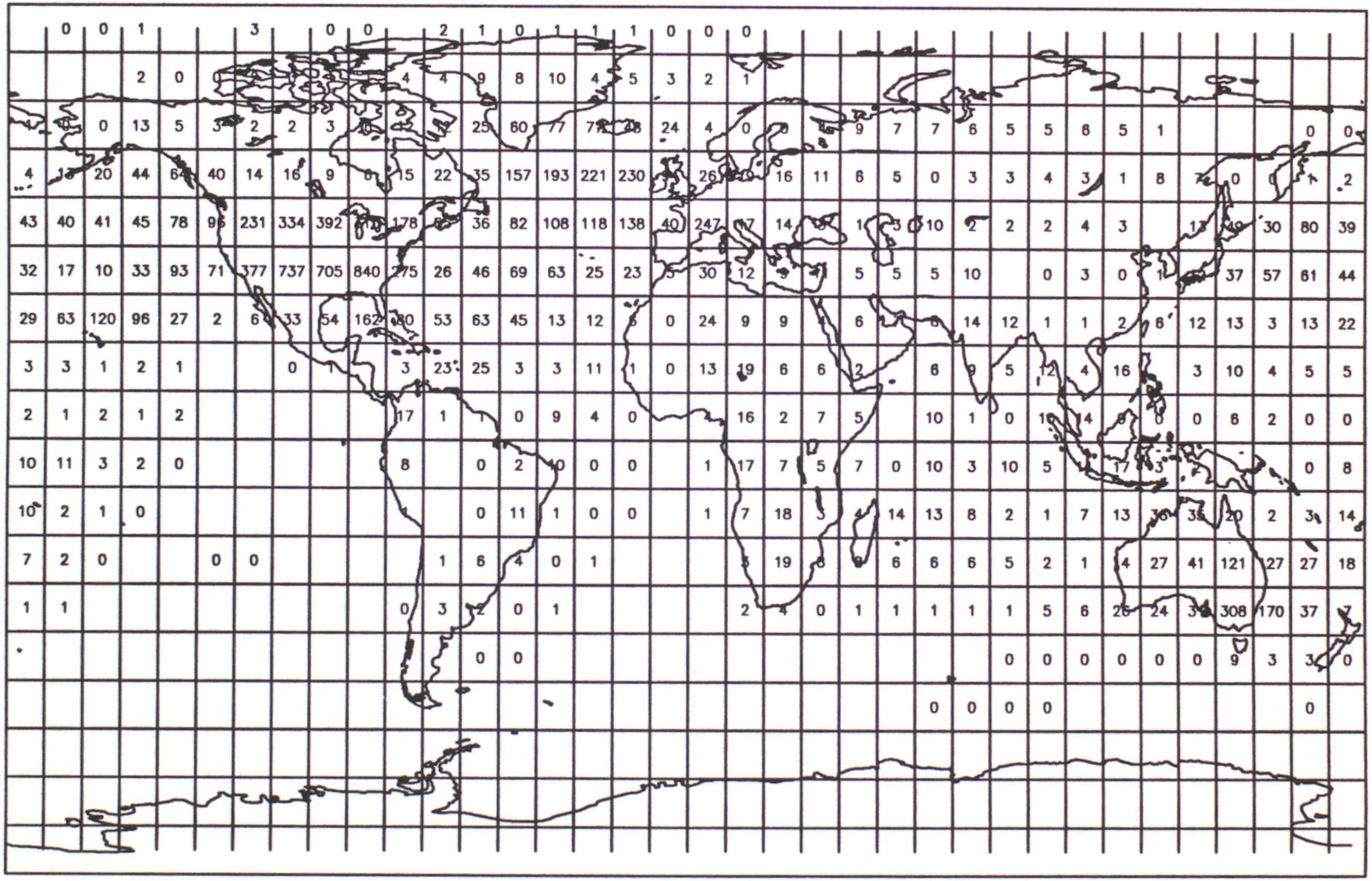
		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAA	130	1	2	1.8	0.6	131	0	2	2	7.3	0.8
AAL	5782	0	1	1.9	0.1	5787	0	2	0	8.8	0.9
AAR	1695	0	1	2.1	0.0	1701	0	2	0	8.4	0.6
ACA	1961	1	2	2.1	0.1	2009	0	2	0	7.9	0.7
ACI	50	2	4	1.9	0.9	50	0	0	0	6.7	0.6
AEA	662	1	100	2.3	0.1	641	0	4	0	9.7	1.0
AEL	929	1	3	2.1	-0.6	936	0	3	0	9.1	0.7
AEY	170	0	1	1.8	0.9	173	0	2	0	8.3	1.1
AFL	157	0	1	2.2	0.8	158	0	3	1	8.4	-0.2
AFR	1759	1	4	1.9	0.1	1788	0	5	0	9.2	0.9
AIC	24	13	13	2.4	-0.6	24	0	13	0	15.1	-3.6
AIH	143	2	3	2.1	0.1	147	0	4	0	7.5	0.6
AJM	83	0	2	1.7	-0.7	86	0	3	0	9.4	-0.1
AMT	416	2	5	2.5	1.1	418	0	71	0	8.6	0.9
AMX	263	2	5	2.1	-0.5	265	0	6	0	9.1	0.5
ANA	997	1	2	2.1	-0.2	999	0	2	0	8.6	0.7
ANZ	2519	4	6	2.0	0.0	2457	0	3	1	7.6	1.2
AOM	585	1	3	1.9	1.0	596	0	3	0	7.7	1.0
ARP	122	1	2	2.1	1.1	104	1	3	0	7.9	3.8
ATN	71	0	8	2.9	-1.5	67	0	93	0	20.7	4.7
AUA	41	0	2	1.7	-0.2	42	0	2	0	8.3	0.8
AVA	354	1	4	2.2	0.0	358	0	4	0	10.2	0.3
AVN	39	8	8	0.8	0.2	37	0	0	0	5.2	0.5
AXA	53	2	0	2.8	1.2	53	0	2	0	8.3	1.1
AZA	626	1	7	2.1	0.5	631	0	7	0	9.6	1.0
BAL	555	1	14	2.0	-0.1	570	0	15	0	8.2	0.3
BAW	1587	0	4	2.1	-0.1	1589	0	4	0	8.7	0.8
BBB	34	0	0	1.3	0.0	33	0	3	0	8.6	2.6
BOE	21	0	0	2.5	2.1	22	0	0	0	7.3	0.9
BWA	425	3	42	2.6	1.9	437	0	7	0	9.9	0.8
CAL	1656	1	2	2.2	0.0	1668	0	2	0	9.1	0.8
CCA	160	2	92	3.1	0.3	172	0	92	0	13.0	-0.4
CDN	2040	1	1	2.0	0.4	2050	0	1	0	8.1	0.6
CES	259	0	1	2.4	0.3	260	0	4	0	10.6	-1.1
CFC	46	0	20	2.5	0.1	58	0	24	0	9.9	-2.7
CFG	1330	0	2	2.0	-0.9	1356	0	2	0	8.2	0.3
CKS	249	0	66	2.3	1.0	252	1	66	0	9.0	1.2
CKT	157	3	8	2.0	0.6	156	0	4	0	7.8	0.2
CLX	360	1	3	2.2	-0.5	364	0	2	0	8.5	1.0
CMI	678	1	3	2.5	1.0	683	0	2	0	8.7	0.5
CMM	287	0	1	1.8	-0.1	285	0	3	0	9.5	1.0
COA	754	1	2	1.7	0.7	771	0	4	0	9.3	0.8
CPA	55	0	0	1.5	-0.2	62	0	2	0	9.1	0.7
CRL	882	2	3	1.8	0.3	899	0	3	0	9.0	0.5
CTB	21	0	5	1.9	0.0	23	0	4	0	8.6	1.6
CTM	28	0	4	2.0	1.0	28	0	4	0	8.2	2.2
CUB	494	2	7	2.4	1.5	502	0	100	0	11.3	1.2
DAF	35	3	6	2.8	-1.0	35	0	3	0	9.5	-0.7
DAL	5594	1	3	2.3	0.7	5224	0	3	0	8.8	0.8
DHL	320	3	100	3.4	-1.2	323	0	100	0	12.3	0.5
DLH	3762	1	7	2.0	0.4	3776	0	8	2	8.4	0.8
DOA	78	1	1	2.4	-0.5	78	0	1	0	9.9	0.7
EIA	111	2	12	1.5	0.3	113	0	15	4	9.1	1.0
EIN	30	3	17	2.3	1.0	29	0	17	0	14.0	0.6
ELN	26	0	4	1.6	0.6	26	0	27	0	20.3	1.3
ELY	106	1	8	1.9	0.3	113	0	10	0	10.0	0.1
EVA	435	1	3	2.1	-0.1	443	0	2	0	8.4	0.8
EWW	164	1	5	2.7	1.0	170	1	100	0	18.1	3.5
FDX	1003	0	2	2.1	0.6	1015	0	3	0	8.9	0.7

		TEMPERATURE					WIND				
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
FIN	318	0	2	1.9	0.4	315	0	4	1	10.0	0.3
FJI	428	5	5	1.6	0.8	412	0	2	0	6.9	1.0
FNY	32	3	3	1.3	0.5	34	0	3	0	7.7	3.2
FOM	110	3	7	2.5	1.2	109	0	100	1	11.6	1.1
GAF	92	2	4	2.7	1.0	94	0	3	0	7.7	1.1
GHA	35	0	0	1.8	1.1	38	0	0	0	7.2	2.4
GIA	190	1	1	2.0	0.9	193	0	2	1	8.0	1.7
HAL	1936	0	1	1.9	0.3	1938	0	2	0	9.0	1.1
HLF	221	2	3	1.7	-0.8	218	0	72	0	8.6	0.5
HRH	36	6	8	1.4	0.8	34	0	3	0	6.1	0.3
IBE	3069	1	20	2.2	0.6	3072	0	22	0	9.9	0.9
ICE	613	0	1	1.9	0.0	612	0	3	0	8.8	0.8
JAA	27	4	11	3.6	2.3	26	0	4	0	9.9	3.5
JAL	5748	0	1	2.2	0.3	5772	0	2	0	8.6	0.5
JAZ	78	0	1	2.6	1.9	78	0	1	0	8.1	0.0
KAL	2750	1	2	2.3	-0.2	2755	0	2	0	8.7	0.5
KLM	2701	0	2	2.0	0.4	2700	0	3	0	8.8	0.7
LDA	297	1	7	2.1	-0.7	300	0	7	0	9.1	0.7
LDI	500	1	18	2.0	-1.1	502	0	19	0	8.8	0.7
LIB	381	2	3	1.9	1.1	389	0	3	0	8.1	0.6
LKR	21	0	5	1.7	1.0	20	0	5	0	8.7	-2.2
LOT	288	1	3	2.6	-1.2	288	0	3	0	9.6	0.7
LTU	1031	1	3	1.8	0.1	1014	0	4	0	9.4	0.8
MAH	29	0	3	2.3	-0.5	31	0	3	0	9.3	-1.3
MAS	340	1	2	2.3	-0.5	355	0	5	0	9.4	-0.1
MDA	149	1	1	1.8	0.4	150	0	3	0	7.8	-0.3
MON	22	0	5	2.2	0.8	23	0	4	0	8.9	0.4
MPH	885	0	1	1.9	-0.6	886	0	2	0	8.5	0.7
NCA	552	0	1	1.8	0.5	552	0	3	0	8.6	0.7
NWA	9109	1	2	2.3	0.7	9133	0	2	0	8.5	0.7
PAC	104	1	2	1.9	1.0	105	0	0	0	6.4	0.9
PAL	1078	0	3	2.3	0.0	1084	0	3	1	8.8	1.0
PAO	204	1	5	1.3	0.3	201	0	4	0	6.0	1.2
PIA	24	4	8	1.8	0.3	24	0	8	0	10.5	1.9
QFA	1323	1	3	1.7	0.6	1324	0	3	1	6.9	1.4
RAF	161	0	1	1.8	0.9	161	0	2	0	8.8	0.6
RAM	35	0	0	2.5	-0.7	35	0	3	0	11.7	-0.1
RCH	494	3	96	3.1	0.6	489	0	96	0	12.6	1.4
RJA	64	0	2	1.8	0.5	67	0	3	0	10.8	-1.1
RKA	126	2	4	1.9	-0.2	126	0	5	0	9.0	0.7
RRR	120	3	16	2.5	0.0	120	0	18	1	9.9	0.9
SAA	279	1	3	2.0	-0.3	283	0	4	0	8.5	0.6
SAB	53	0	2	1.7	0.2	54	0	0	0	7.5	1.1
SAS	1037	0	1	1.8	0.4	1039	0	3	0	8.9	0.5
SEU	81	1	4	1.9	-0.6	82	0	5	0	9.0	1.7
SIA	1209	0	2	2.1	-0.6	1227	0	3	0	8.7	-0.1
SLR	93	0	20	1.7	-0.5	96	0	21	0	7.5	-0.5
SOL	45	0	0	1.1	0.6	46	2	11	4	8.4	1.4
SPP	409	0	9	1.9	-0.1	385	0	10	0	8.6	0.9
SVA	119	1	9	2.3	0.4	124	0	100	0	13.3	2.7
SWR	175	1	2	1.6	0.1	179	0	3	0	8.0	1.8
TAM	21	0	5	1.6	0.1	20	0	10	0	9.7	5.1
TAP	480	2	7	2.2	0.0	478	0	5	0	8.5	1.2
TEJ	62	0	26	2.1	0.5	65	0	23	0	9.1	2.0
THA	229	0	2	2.6	-0.6	235	0	5	0	10.0	-0.1
THY	30	0	20	4.5	3.7	35	0	31	0	15.3	6.1
TOW	102	0	5	2.1	0.0	110	1	8	0	9.5	1.2
TWA	1419	1	2	2.1	0.1	1419	0	2	0	9.4	1.6
TWE	25	0	8	3.4	1.7	25	0	0	0	7.0	-1.1

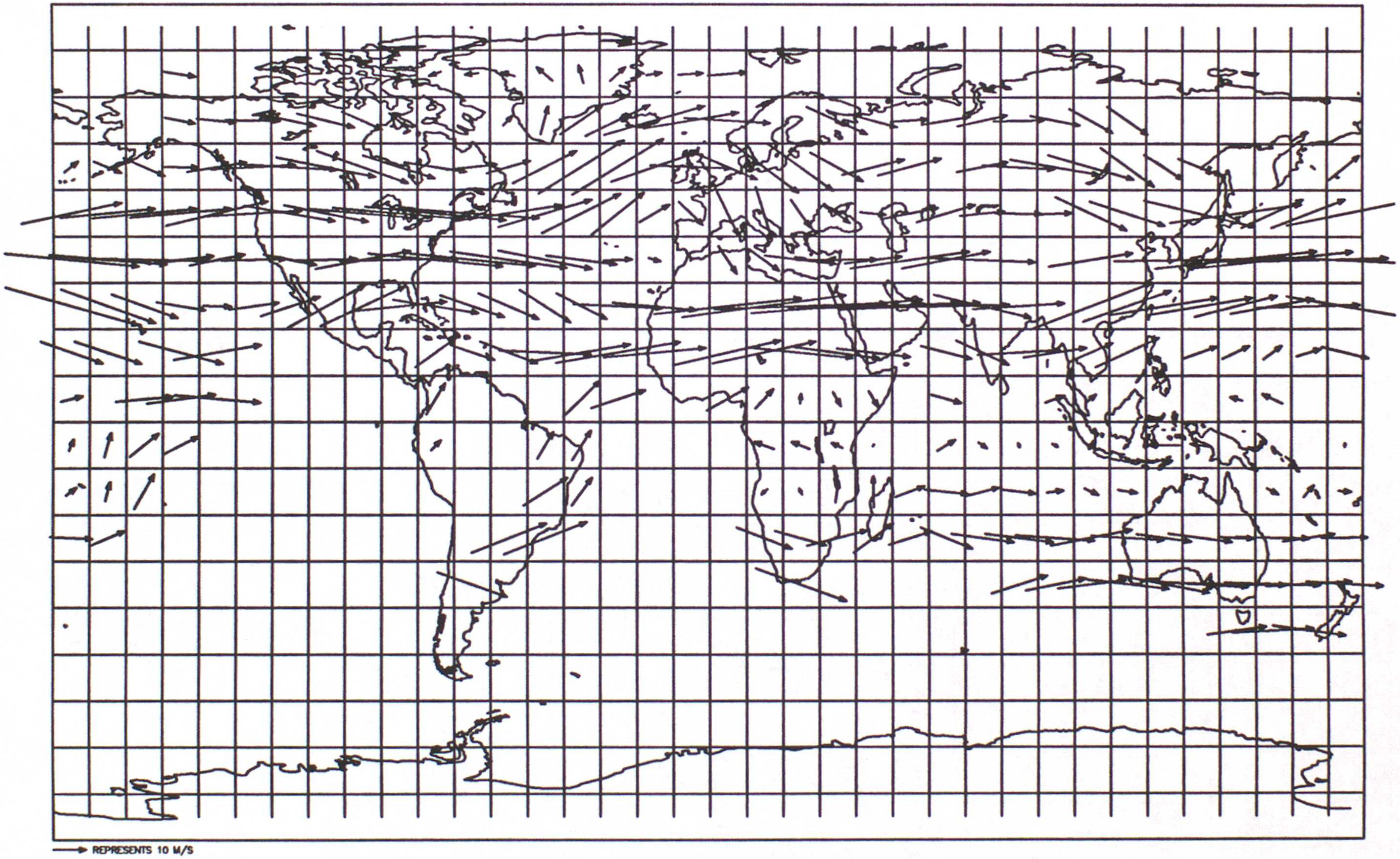
		TEMPERATURE				WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
UAL	12009	1	2	2.2	-0.1	12060	0	2	0	8.1	0.7
ULE	274	1	3	2.0	0.8	280	0	3	0	9.5	0.4
UPS	847	1	11	1.9	0.3	863	0	11	0	8.3	1.0
USA	469	1	2	1.9	-0.1	468	0	4	0	10.4	1.0
VIR	281	0	2	1.9	-0.3	281	0	3	0	8.2	1.3
VRG	66	2	5	2.3	1.1	66	0	6	0	8.5	1.7
VSP	164	2	4	2.5	0.8	167	0	4	0	9.5	0.0
AF	26	0	4	1.4	-0.3	26	0	4	0	8.2	1.7
AN	22491	1	2	0.9	0.1	22346	0	2	0	5.4	0.6
BA	23085	2	11	1.6	0.5	23040	0	9	0	7.4	1.4
DL	101312	0	2	1.6	0.1	101309	0	8	0	6.7	1.1
IT	464	0	0	0.9	0.0	464	0	1	0	6.3	1.6
KL	11529	1	6	1.3	0.3	11526	0	6	0	7.0	1.1
LH	3857	1	2	1.6	0.3	3819	0	3	0	7.1	1.3
MK	6333	0	1	1.1	0.7	6281	0	2	0	7.4	2.0
NW	39172	0	2	1.6	0.2	39172	0	2	0	6.5	0.9
QF	4129	1	2	1.1	0.3	4129	0	2	1	5.9	0.8
SA	4106	1	2	1.3	0.7	4106	0	2	0	6.7	1.1
N	543	4	99	2.9	0.8	568	0	4	0	9.8	0.8

MEAN DAILY COUNT OF AIRCRAFT 70 – 500 HPA
MARCH 1997
OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

FIGURE 3


0 0 1 3 0 0 2 1 0 1 1 1 0 0 0
2 0 4 4 9 8 10 4 5 3 2 1
0 13 5 3 2 2 3 25 60 77 77 48 24 4 0 9 7 7 6 5 5 6 5 1 0 0
4 20 44 64 40 14 16 9 15 22 35 157 193 221 230 26 16 11 6 5 0 3 3 4 3 1 8 0 2
43 40 41 45 78 96 231 334 392 178 36 82 108 118 138 40 247 14 10 2 2 4 3 30 80 39
32 17 10 33 93 71 377 737 705 840 275 26 46 69 63 25 23 30 12 5 5 5 10 0 3 0 37 57 81 44
29 63 120 96 27 2 6 33 54 162 80 53 63 45 13 12 0 24 9 9 6 14 12 1 1 2 6 12 13 3 13 22
3 3 1 2 1 0 3 23 25 3 3 11 0 13 19 6 6 2 6 9 5 12 4 16 3 10 4 5 5
2 1 2 1 2 17 1 0 9 4 0 16 2 7 5 10 1 0 14 0 6 2 0 0
10 11 3 2 0 8 0 2 10 0 0 1 17 7 5 7 0 10 3 10 5 17 3 0 8
10 2 1 0 0 11 1 0 0 1 7 18 4 14 13 8 2 1 7 13 36 35 20 2 3 14
7 2 0 0 0 1 6 4 0 1 19 6 6 6 5 2 1 4 27 41 121 27 27 18
1 1 0 3 2 0 1 2 4 0 1 1 1 1 1 5 6 26 24 34 308 170 37 7
0 0 0 0 0 0 0 0 9 3 3 0
0 0 0 0 0

AIRCRAFT MEAN WINDS BETWEEN 70 AND 500 HPA FIGURE 4
MARCH 1997
OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT



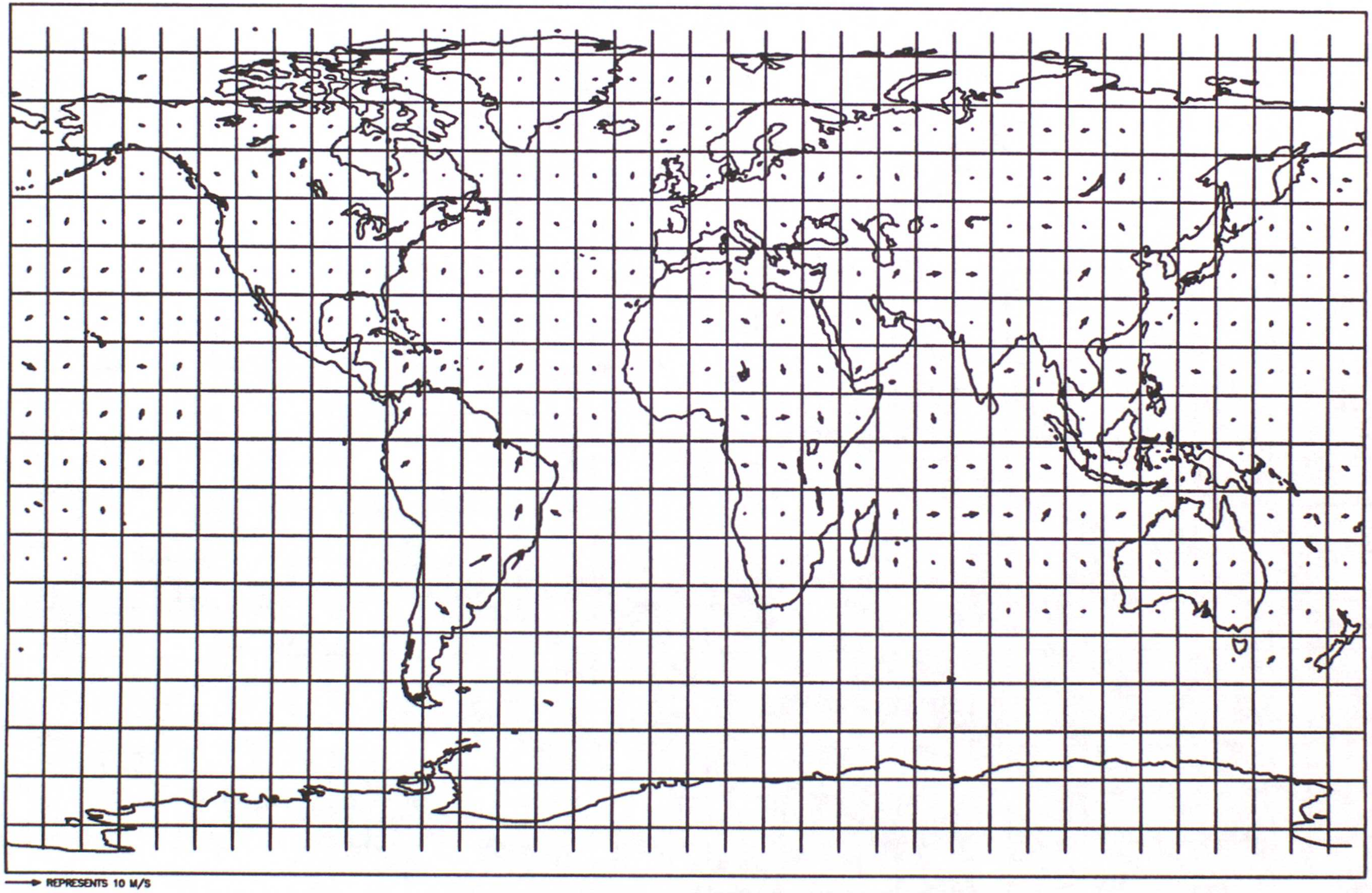
AIRCRAFT MEAN O–B WINDS BETWEEN 70 AND 500 HPA

FIGURE 5

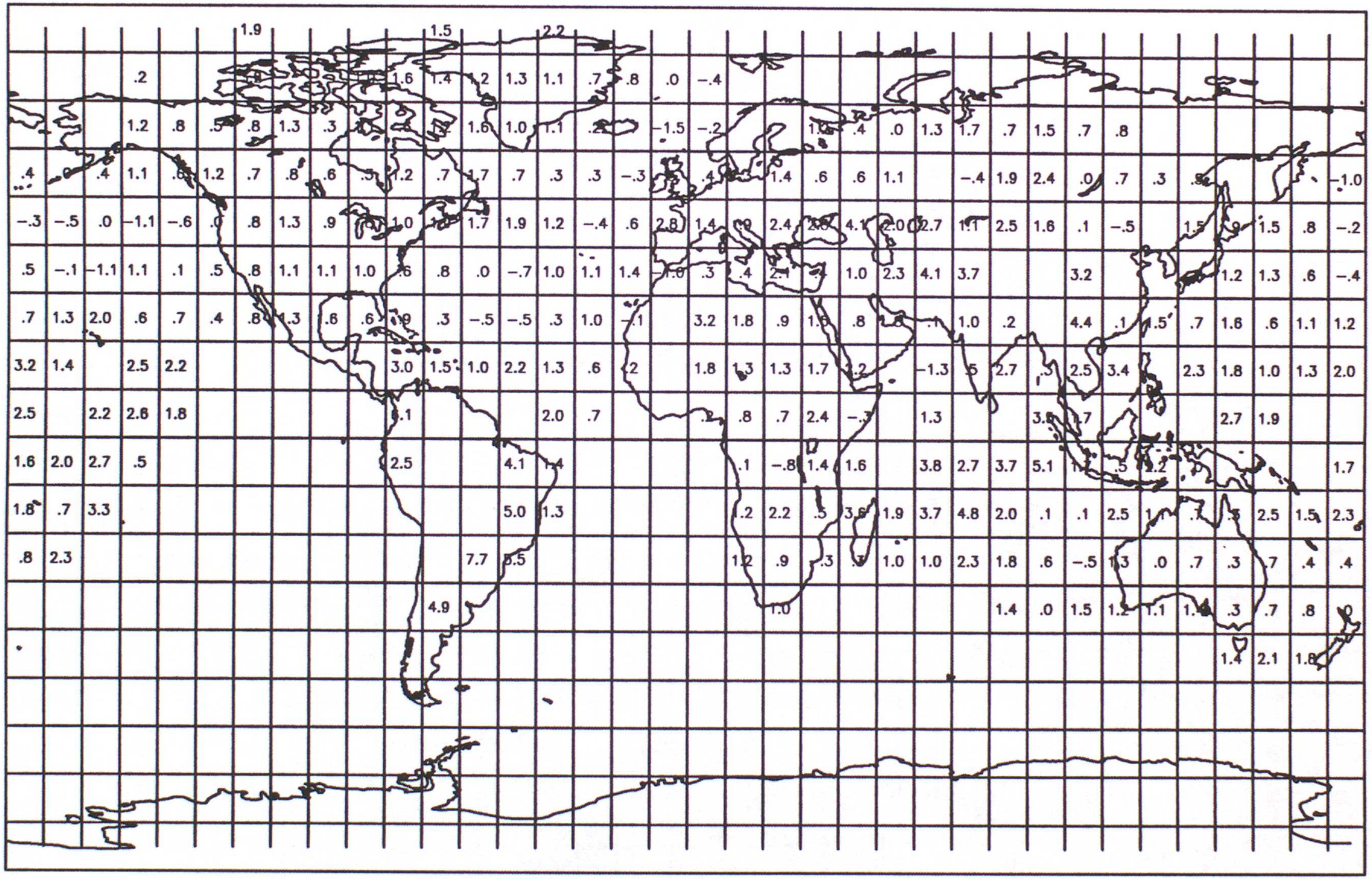
MARCH 1997

OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT



AIRCRAFT : MEAN O-B SPEEDS (M/S) BETWEEN 70 AND 500 HPA FIGURE 6
MARCH 1997
OBSERVATIONS WITH O-B VECTOR DIFFERENCE > 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT


1.9 1.5 2.2
.2 1.6 1.4 1.2 1.3 1.1 .7 .8 .0 -.4
1.2 .8 .5 .8 1.3 .3 1.6 1.0 1.1 -1.5 -.2 .4 .0 1.3 1.7 .7 1.5 .7 .8
.4 .4 1.1 1.2 .7 .8 .6 1.2 .7 1.7 .7 .3 .3 -.3 1.4 .6 .6 1.1 -.4 1.9 2.4 .0 .7 .3 -1.0
-.3 -.5 .0 -1.1 -.6 .8 1.3 .9 1.0 1.7 1.9 1.2 -.4 .6 2.8 1.4 2.4 4.1 2.7 2.5 1.6 .1 -.5 1.5 1.5 .8 -.2
.5 -.1 -1.1 1.1 .1 .5 .8 1.1 1.1 1.0 .8 .0 -.7 1.0 1.1 1.4 .3 .4 1.0 2.3 4.1 3.7 3.2 1.2 1.3 .6 -.4
.7 1.3 2.0 .6 .7 .4 .8 1.3 .6 .6 .3 -.5 -.5 .3 1.0 3.2 1.8 .9 .8 1.0 .2 4.4 .1 .7 1.6 .6 1.1 1.2
3.2 1.4 2.5 2.2 3.0 1.5 1.0 2.2 1.3 .6 1.8 1.3 1.7 -1.3 2.7 2.5 3.4 2.3 1.8 1.0 1.3 2.0
2.5 2.2 2.6 1.8 2.0 .7 .8 .7 2.4 1.3 2.7 1.9
1.6 2.0 2.7 .5 2.5 4.1 .1 -.8 1.4 1.6 3.8 2.7 3.7 5.1 1.7
1.8 .7 3.3 5.0 1.3 2.2 1.9 3.7 4.8 2.0 .1 .1 2.5 2.5 2.3
.8 2.3 7.7 5.5 .9 1.0 1.0 2.3 1.8 .6 -.5 .0 .7 .3 .4 .4
4.9 1.0 1.4 .0 1.5 .3 .7 .8
1.4 2.1

AIRCRAFT : RMS O–B VECTOR (M/S) BETWEEN 70 AND 500 HPA FIGURE 7
MARCH 1997
OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

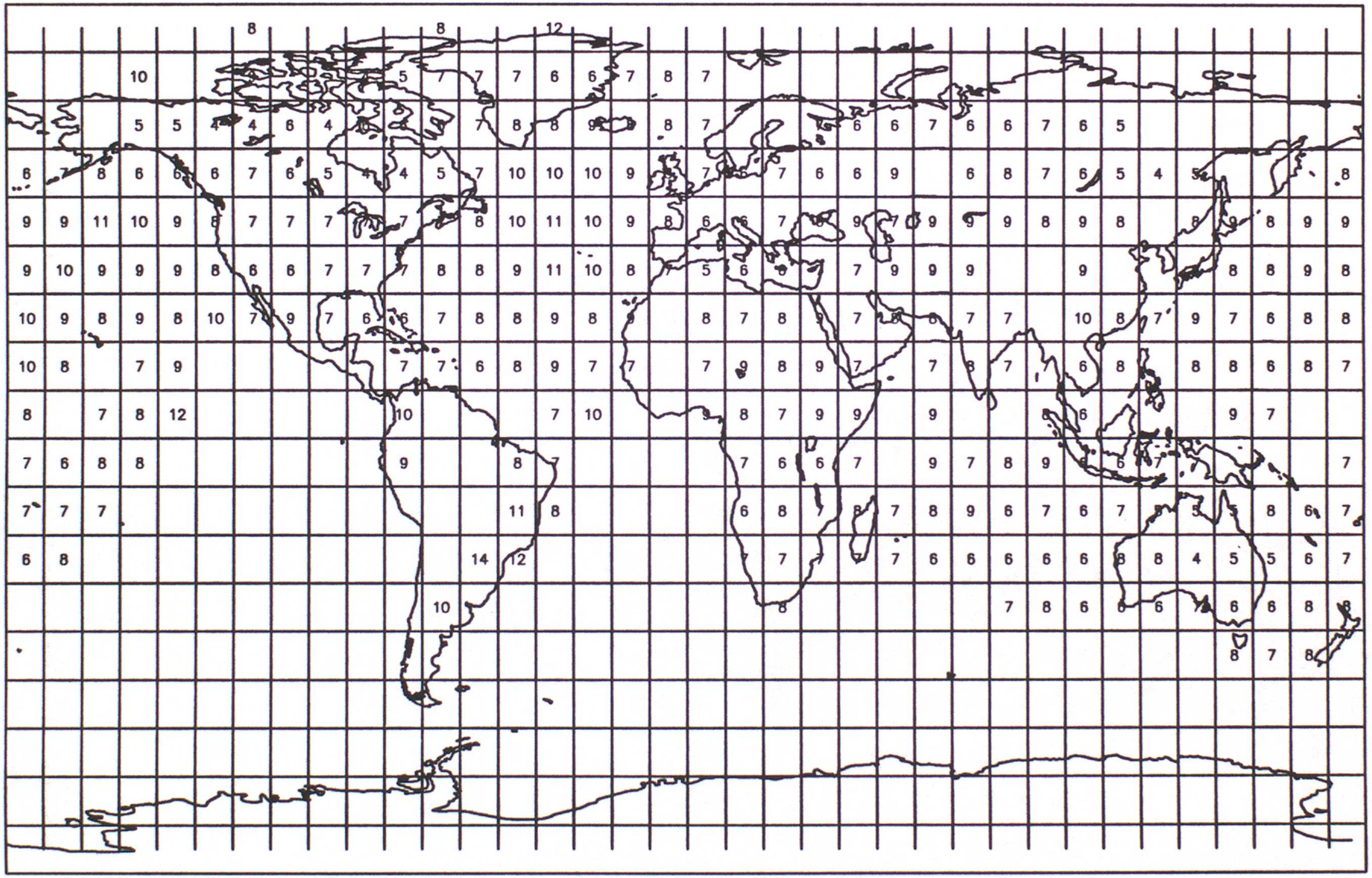

8 8 12
10 5 7 7 7 6 6 7 8 7
5 5 4 4 6 4 7 8 8 9 9 8 7 6 6 7 6 6 7 6 5
6 7 8 6 6 6 7 6 5 4 4 5 7 10 10 10 9 8 7 6 7 6 6 9 6 8 7 6 5 4 5 8
9 9 11 10 9 8 7 7 7 7 8 10 11 10 9 8 6 6 7 8 9 7 9 9 9 8 9 8 8 9 8 9 9
9 10 9 9 9 8 6 6 7 7 7 8 8 9 11 10 8 7 5 6 6 7 9 9 9 9 8 8 9 8
10 9 8 9 8 10 7 9 7 6 6 7 8 8 9 8 9 8 7 8 9 7 8 6 7 7 10 8 7 9 7 6 8 8
10 8 7 9 7 7 6 8 9 7 7 7 9 8 9 7 7 8 7 7 6 8 8 8 6 8 7
8 7 8 12 10 7 10 9 8 7 9 9 9 8 6 9 7
7 6 8 8 9 8 7 7 6 6 7 9 7 8 9 6 7 7
7 7 7 11 8 6 8 7 8 7 8 9 6 7 6 7 8 5 5 8 6 7
6 8 14 12 7 7 7 7 7 6 6 6 6 6 8 8 4 5 5 6 7
10 8 7 8 6 6 6 7 6 6 8 8
8 7 8

TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: March, 1997

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 30.0 hPa
Element monitored		:GEOPOTENTIAL HEIGHT IN metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown duringperiod.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.

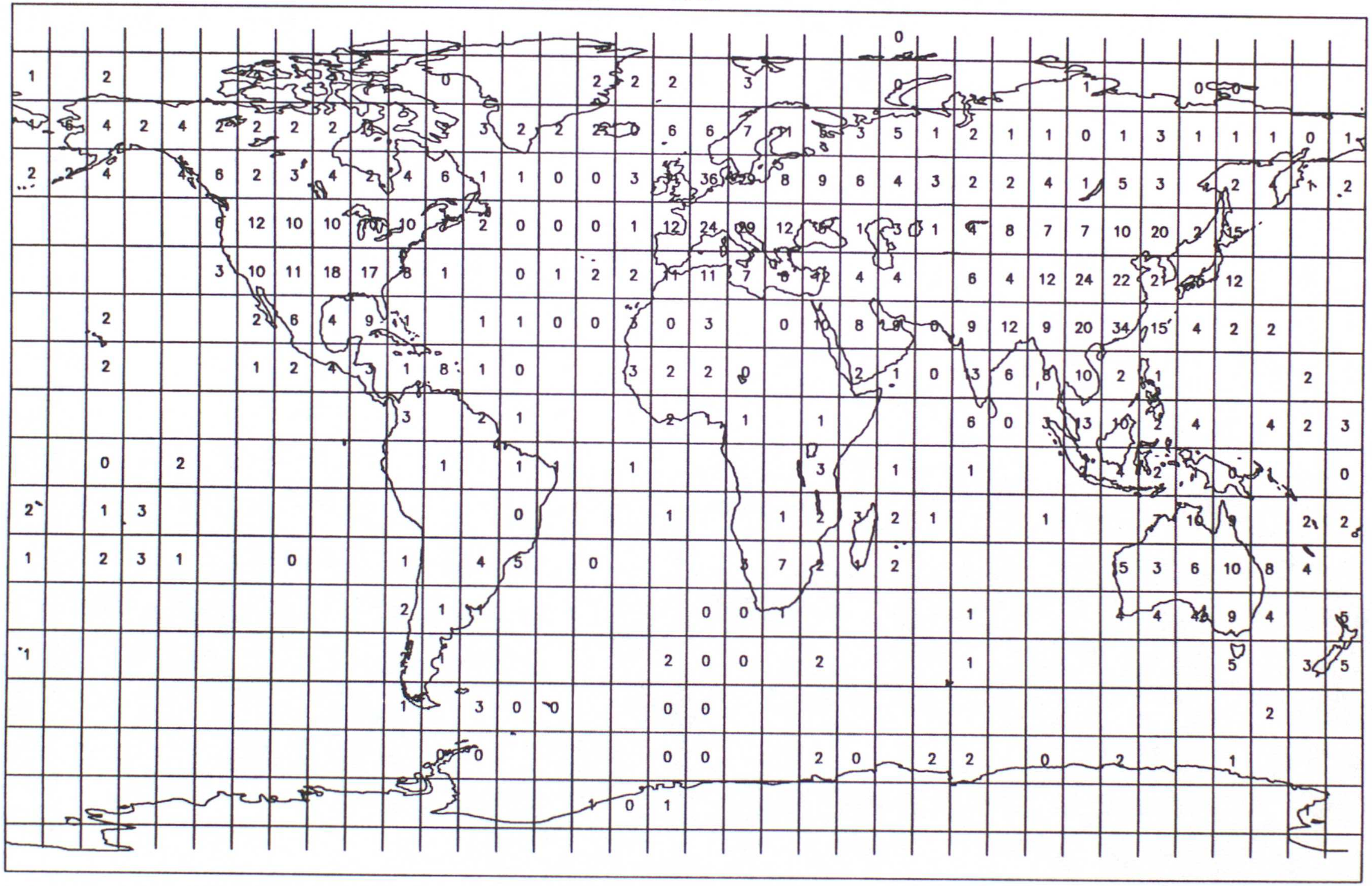
GROSS ERROR LIMITS :Defined in Appendix I.1

SELECTION CRITERIA : ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
22217	12	Z	300	67/ 32	27	0	25.9	70.4	75.1	6
25563	00	Z	150	65/ 178	11	0	42.8	116.0	123.6	4
33345	00	Z	150	50/ 31	24	0	95.0	46.9	106.0	5
42361	00	Z	150	26/ 78	16	0	77.0	-73.1	106.2	6
42361	12	Z	200	26/ 78	17	1	73.6	-61.4	95.9	8
42369	12	Z	30	27/ 81	10	1	136.2	224.8	262.8	8
42379	00	Z	30	27/ 83	13	2	175.7	222.8	283.7	10
42379	12	Z	50	27/ 83	16	4	116.7	211.8	241.8	10
42397	00	Z	200	27/ 88	18	0	71.0	-69.2	99.1	7
42397	12	Z	400	27/ 88	15	0	49.0	-35.3	60.3	6
42492	00	Z	100	26/ 85	22	0	106.7	-15.8	107.9	4
42647	00	Z	70	23/ 73	18	0	106.6	-91.9	140.7	6
42647	12	Z	50	23/ 73	14	0	108.5	143.8	180.1	6
42667	12	Z	70	23/ 77	10	0	80.9	122.8	147.0	5
42724	00	Z	150	24/ 91	12	0	79.0	60.8	99.7	5
42867	00	Z	400	21/ 79	19	0	55.9	-62.4	83.8	9
42874	00	Z	100	21/ 82	17	0	124.3	-54.1	135.6	4
42971	00	Z	30	20/ 86	16	0	119.9	139.1	183.6	5
42971	12	Z	30	20/ 86	17	0	145.9	130.2	195.6	7
43003	12	Z	50	19/ 73	11	1	71.9	194.5	207.4	7
43014	00	Z	100	20/ 75	11	0	126.3	-92.1	156.3	5
43128	00	Z	200	17/ 78	25	0	70.6	-78.5	105.5	10
43128	12	Z	50	17/ 78	15	0	156.5	150.0	216.7	8
43150	00	Z	400	18/ 83	24	0	38.1	-54.9	66.8	7
43185	00	Z	250	16/ 81	26	1	82.9	-11.5	83.7	9
43185	12	Z	70	16/ 81	14	1	164.3	129.9	209.5	8
43192	12	Z	100	15/ 74	12	2	99.6	119.8	155.8	10
43279	12	Z	30	13/ 80	13	0	85.4	220.0	236.0	6
43285	00	Z	100	13/ 75	15	0	110.8	-69.9	131.0	6
43295	12	Z	150	13/ 78	12	0	66.8	145.6	160.2	6
43346	12	Z	30	11/ 80	17	2	134.0	196.2	237.5	7
43353	00	Z	250	10/ 76	22	1	63.2	-51.3	81.4	6
43369	00	Z	70	8/ 73	12	0	119.6	-66.1	136.6	5
43369	12	Z	70	8/ 73	11	1	154.4	-22.2	156.0	4
43371	00	Z	50	8/ 77	22	2	87.2	-236.1	251.7	9
53513	12	Z	150	41/ 107	30	0	58.9	72.2	93.2	4
54497	00	Z	70	40/ 124	17	0	53.2	118.1	129.5	7
55591	12	Z	30	30/ 91	15	0	70.1	163.7	178.1	4
57494	00	Z	100	31/ 114	30	0	40.6	116.6	123.5	8
57494	12	Z	100	31/ 114	30	0	39.4	109.0	115.9	6
58203	12	Z	70	33/ 116	24	0	69.3	99.1	120.9	4
58238	00	Z	150	32/ 119	29	0	31.2	88.8	94.2	4
58633	00	Z	100	29/ 119	30	0	46.2	109.9	119.2	5
60360	12	Z	500	37/ 8	4	14	14.0	-126.7	127.5	8
60490	12	Z	400	36/ -1	6	16	38.3	-142.3	147.4	9
62378	12	Z	70	30/ 31	17	1	71.1	107.4	128.8	4
62414	00	Z	50	24/ 33	13	0	100.0	224.3	245.6	4
62414	12	Z	30	24/ 33	7	6	78.3	283.0	293.6	7
63450	12	Z	700	9/ 39	17	0	7.2	75.9	76.2	8
68240	12	Z	250	-24/ 26	9	1	71.2	-34.6	79.2	5
89022	12	Z	100	-75/ -27	14	11	121.0	-90.5	151.1	9
91557	12	Z	200	-18/ 168	28	1	36.5	-192.4	195.9	9
96237	00	Z	250	-2/ 106	18	0	37.1	-82.7	90.7	7
97560	00	Z	250	-1/ 136	22	0	59.8	-44.0	74.3	6
97560	12	Z	50	-1/ 136	14	0	90.4	-146.8	172.4	8

AVAILABILITY – TEMP – 500 HPA GEOPOTENTIAL – MARCH 1997 FIGURE 8
ALL HOURS
10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS
GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS – 1313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2 2 4 4 6 2 3 4 2 4 6 1 1 0 0 3 31 36 29 8 9 6 4 3 2 2 4 1 5 3 2 1 2
6 12 10 10 10 10 2 0 0 0 1 12 24 29 12 10 1 3 1 4 8 7 7 10 20 2 15
3 10 11 18 17 8 1 0 1 2 2 11 11 7 8 42 4 4 6 4 12 24 22 21 26 12
2 2 6 4 9 11 1 1 0 0 3 0 3 0 10 8 9 0 9 12 9 20 34 15 4 2 2
2 1 2 4 3 1 8 1 0 3 2 2 0 2 1 0 13 6 8 10 2 1 2
3 2 1 2 1 1 6 0 3 13 10 2 4 4 2 3
0 2 1 1 1 1 3 1 1 2 0 1 0
2 1 3 0 1 1 2 3 2 1 1 7 10 9 2 2
1 2 3 1 0 1 4 5 0 3 7 2 1 2 5 3 6 10 8 4
2 1 1 0 0 1 1 4 4 42 9 4 5
1 2 0 0 2 1 5 3 5
1 3 0 0 0 0 2
0 0 0 2 0 2 2 0 2 1
1 0 1

TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: March, 1997

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from Bracknell global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 1000.0 - 100.0 hPa

Element monitored :VECTOR WIND in m s^{-1}

Parameters monitored

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period.

:UBIAS,VBIAS :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

:NUM LEVELS :Number of levels satisfying selection criteria.

GROSS ERROR LIMITS :Defined in Appendix I.2

SELECTION CRITERIA : $\geq$ 10 observations and $\geq$ 15 m s^{-1} RMS vector wind.

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
42339	00	V	200	26/ 73	19	0	5	-15.3	-4.8	15.8	1
42369	12	V	100	27/ 81	11	0	27	12.0	-17.1	19.0	1
43014	00	V	150	20/ 75	12	0	8	13.6	-0.2	18.4	1
78073	12	V	200	25/ -77	26	0	19	-16.3	4.3	16.4	1

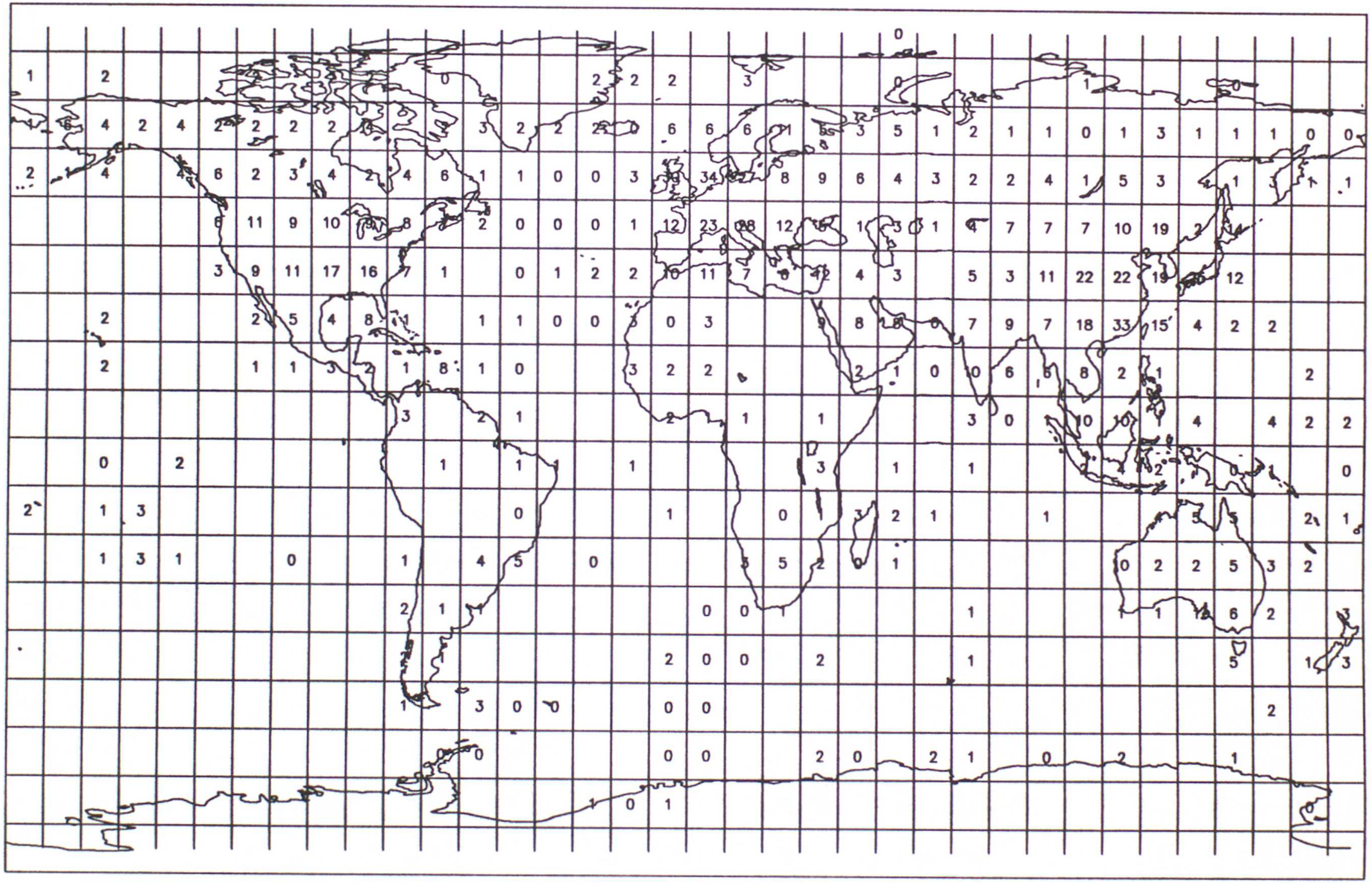
AVAILABILITY – TEMP/PILOT – 300 HPA WIND – MARCH 1997

ALL HOURS

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS – 1179

FIGURE 9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6 4 2 4 2 2 2 2 14 3 2 2 25 6 6 6 11 55 3 5 1 2 1 1 0 1 3 1 1 1 0 0
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6 11 9 10 19 8 2 2 0 0 0 1 12 23 38 12 16 1 3 3 1 4 7 7 7 10 19 2 14
3 9 11 17 16 7 1 0 1 2 2 10 11 7 6 42 4 3 5 3 11 22 22 19 10 12
2 2 5 4 8 1 1 1 0 0 3 0 3 9 8 18 6 7 9 7 18 33 15 4 2 2
2 1 1 3 2 1 8 1 0 3 2 2 2 1 0 10 6 6 8 2 1 2
3 2 1 2 1 1 3 0 10 10 1 4 4 2 2
0 2 1 1 1 1 3 1 1 2 4 2 1 0
2 1 3 0 1 0 3 2 1 1 5 5 2 1
1 3 1 0 1 4 5 0 5 5 2 0 1 10 2 2 5 3 2
2 1 1 0 0 1 1 1 1 12 6 2 3
2 0 0 2 1 5 1 3
1 3 0 0 0 0 2
0 0 0 2 0 2 1 0 2 1
1 0 1 0

TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: March, 1997

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from Bracknell global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 500.0 - 150.0 hPa

Element monitored :WIND DIRECTION in degrees

Parameters monitored

:NUM OBS :Average number of observations at all levels.

:BIAS :Mean difference of observations from background values from all levels.

:MAX SPREAD :(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels

:SD :SD of difference of observations from background values at all levels.

SELECTION CRITERIA :NUM OBS ≥ 5, and
ABSOLUTE BIAS ≥ 10°, with
SD < 30°, and
MAX SPREAD < 10°

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
02836	00	DD	67/ 27	29	10.2	6.8	17.4
16144	00	DD	45/ 12	26	20.5	8.7	25.4
17240	00	DD	38/ 31	27	-13.6	9.4	22.6
17240	12	DD	38/ 31	27	-15.7	4.3	17.9
25399	00	DD	66/-170	8	13.8	7.9	13.3
40265	00	DD	32/ 36	20	-46.0	2.4	29.9
42339	00	DD	26/ 73	20	14.5	5.6	10.0
42339	12	DD	26/ 73	12	11.6	8.0	12.2
42369	12	DD	27/ 81	13	20.6	4.8	11.3
43369	00	DD	8/ 73	16	11.9	8.9	22.9
48568	00	DD	7/ 101	21	24.0	8.8	23.0
54337	00	DD	41/ 121	27	-18.5	5.7	19.2
54337	12	DD	41/ 121	28	-17.4	1.7	15.0
60571	00	DD	32/ -2	12	22.8	5.3	18.9
62337	00	DD	31/ 34	24	11.3	4.3	7.7
62414	00	DD	24/ 33	24	-11.4	2.0	29.8
67083	00	DD	-19/ 47	15	16.2	6.8	19.3
72476	12	DD	39/-109	26	-13.8	8.0	12.2
76256	12	DD	28/-111	24	-14.1	5.1	19.8
76612	12	DD	21/-103	21	12.7	5.9	16.7
76654	12	DD	19/-104	13	-13.9	6.6	20.6
83780	12	DD	-24/ -47	25	-13.1	5.1	17.7
83827	12	DD	-26/ -55	25	-10.2	7.6	20.3

MONITORING OF SATELLITE WINDS

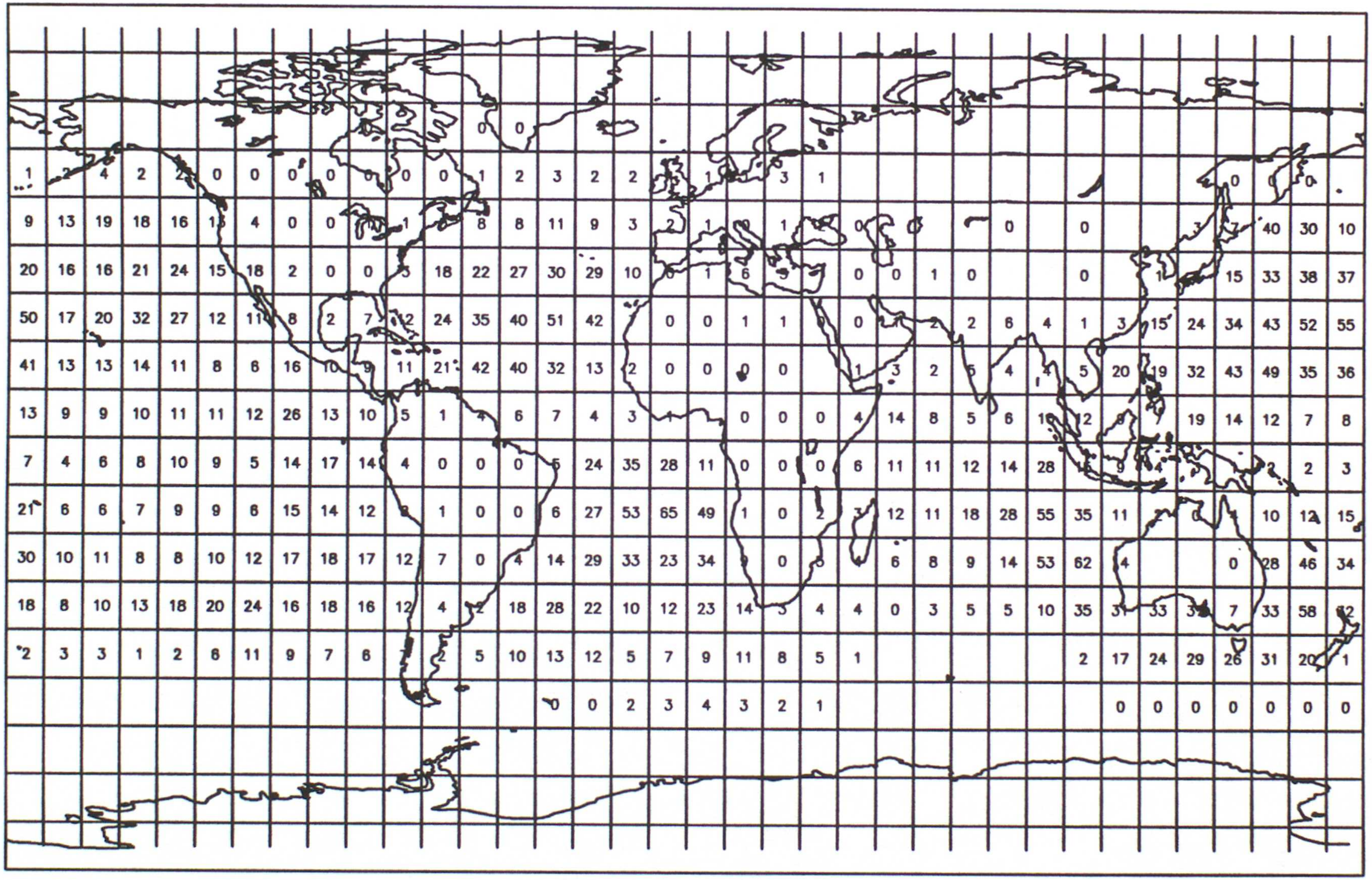
MONITORING CENTRE: BRACKNELL

MONTH: March, 1997

Monitoring procedures

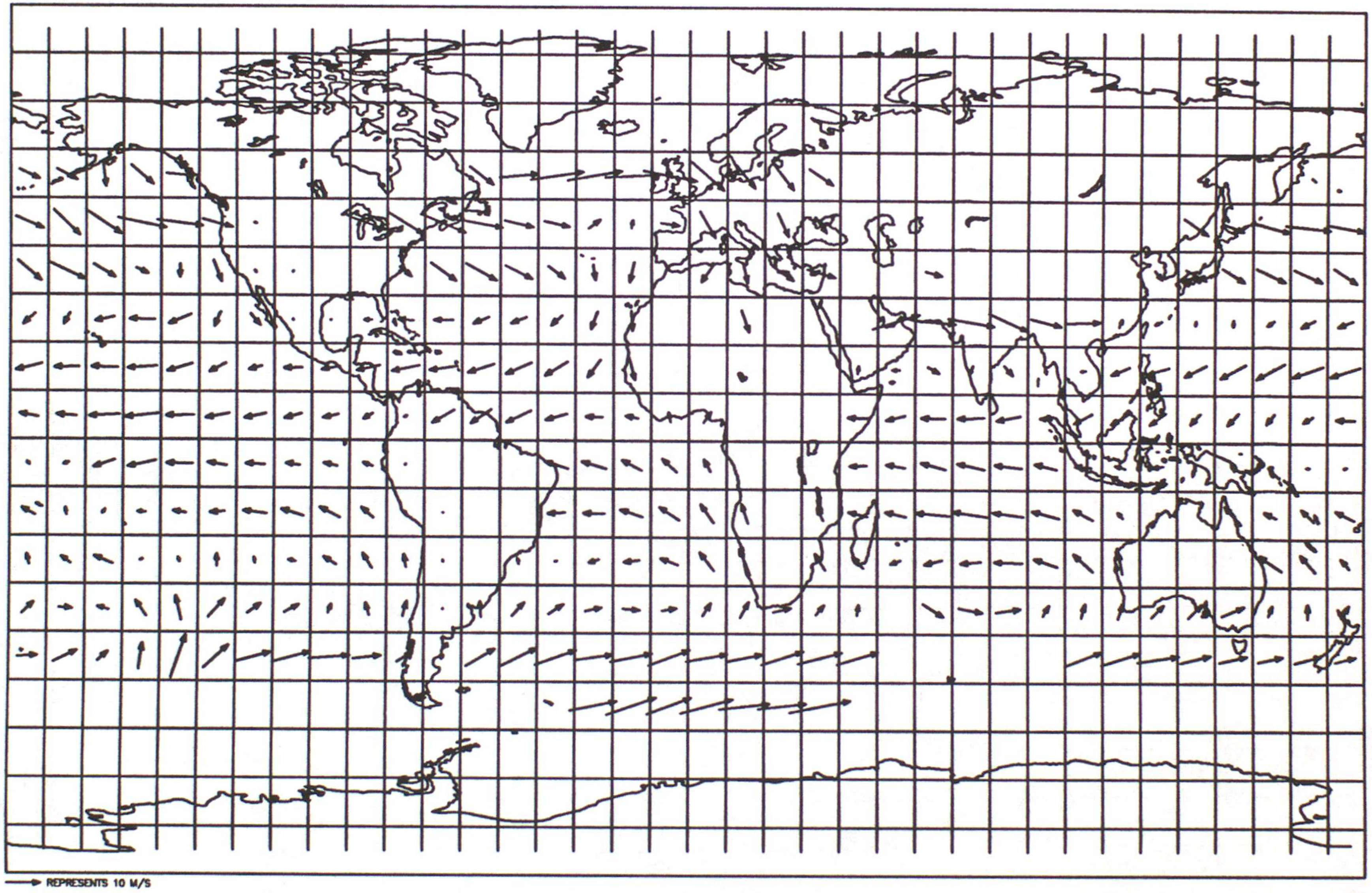
Period	:One calendar month.
Data monitored	:Reports from GOES, METEOSAT, GMS, INSAT.
Standard of comparison	:Background field from Bracknell global model.
Selection Criteria	:number of observations > 10.
Data Extracted	:Layer 701 - 1000 hPa 401 - 700 hPa 101 - 400 hPa
	:Mean wind
	:Mean observation minus background vector wind differences
	:Mean observation minus background speed differences
	:RMS of observation minus background vector differences

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 701 AND 1000 HPA FIGURE 10
MARCH 1997


0 0
1 2 4 2 2 0 0 0 0 0 0 0 1 2 3 2 2 1 3 1 0 0 0
9 13 19 18 16 13 4 0 0 1 8 8 11 9 3 2 1 1 0 0 0 0 3 7 40 30 10
20 16 16 21 24 15 18 2 0 0 3 18 22 27 30 29 10 0 1 6 3 0 0 1 0 0 1 15 33 38 37
50 17 20 32 27 12 11 8 2 7 12 24 35 40 51 42 0 0 1 1 0 1 2 2 6 4 1 3 15 24 34 43 52 55
41 13 13 14 11 8 6 16 10 9 11 21 42 40 32 13 2 0 0 0 0 1 3 2 5 4 4 5 20 19 32 43 49 35 36
13 9 9 10 11 11 12 26 13 10 5 1 4 6 7 4 3 1 0 0 0 4 14 8 5 6 10 12 8 7 19 14 12 7 8
7 4 6 8 10 9 5 14 17 14 4 0 0 0 5 24 35 28 11 0 0 0 6 11 11 12 14 28 15 9 4 2 2 3
21 6 6 7 9 9 6 15 14 12 8 1 0 0 6 27 53 65 49 1 0 2 3 12 11 18 28 55 35 11 2 0 4 10 12 15
30 10 11 8 8 10 12 17 18 17 12 7 0 4 14 29 33 23 34 9 0 5 4 6 8 9 14 53 62 4 0 28 46 34
18 8 10 13 18 20 24 16 18 16 12 4 12 18 28 22 10 12 23 14 3 4 4 0 3 5 5 10 35 31 33 34 7 33 58 62
2 3 3 1 2 6 11 9 7 6 7 2 5 10 13 12 5 7 9 11 8 5 1 2 17 24 29 26 31 20 1
0 0 2 3 4 3 2 1 0 0 0 0 0 0 0

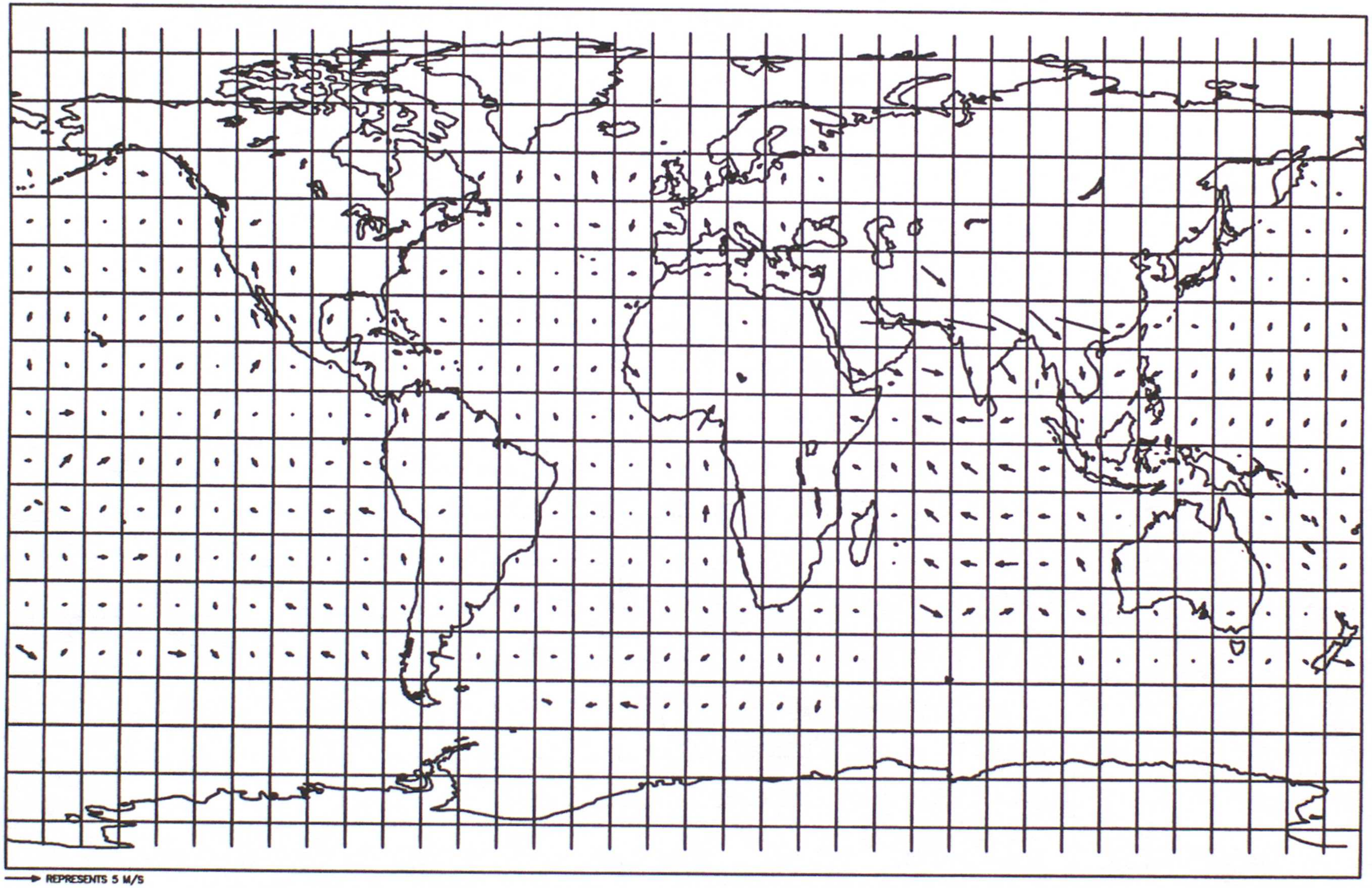
SATOB VECTOR MEAN WINDS BETWEEN 701–1000 HPA
MARCH 1997
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 11

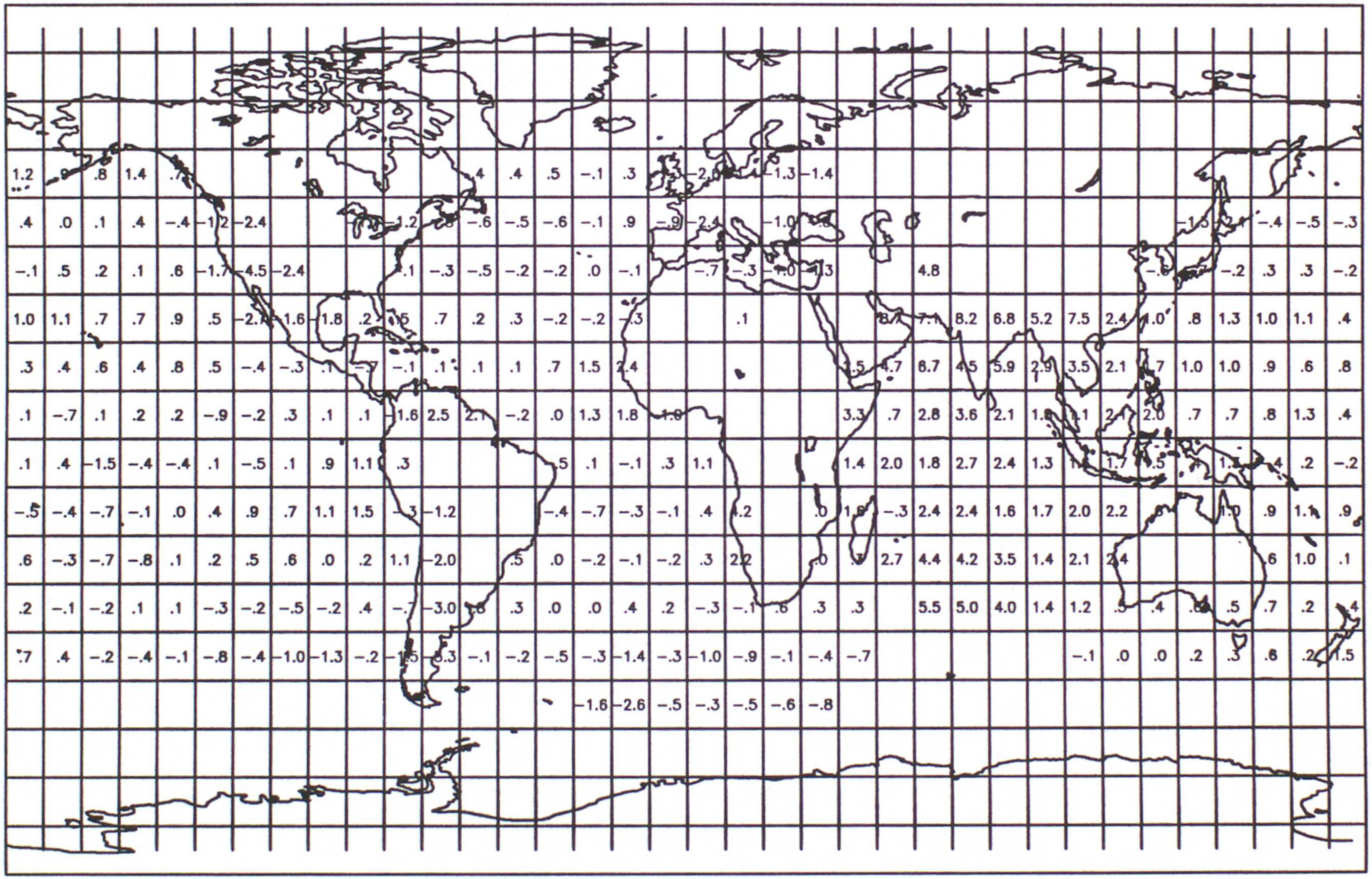

→ REPRESENTS 10 M/S

SATOB O–B VECTOR WIND DIFFERENCES BETWEEN 701–1000 HPA
MARCH 1997
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

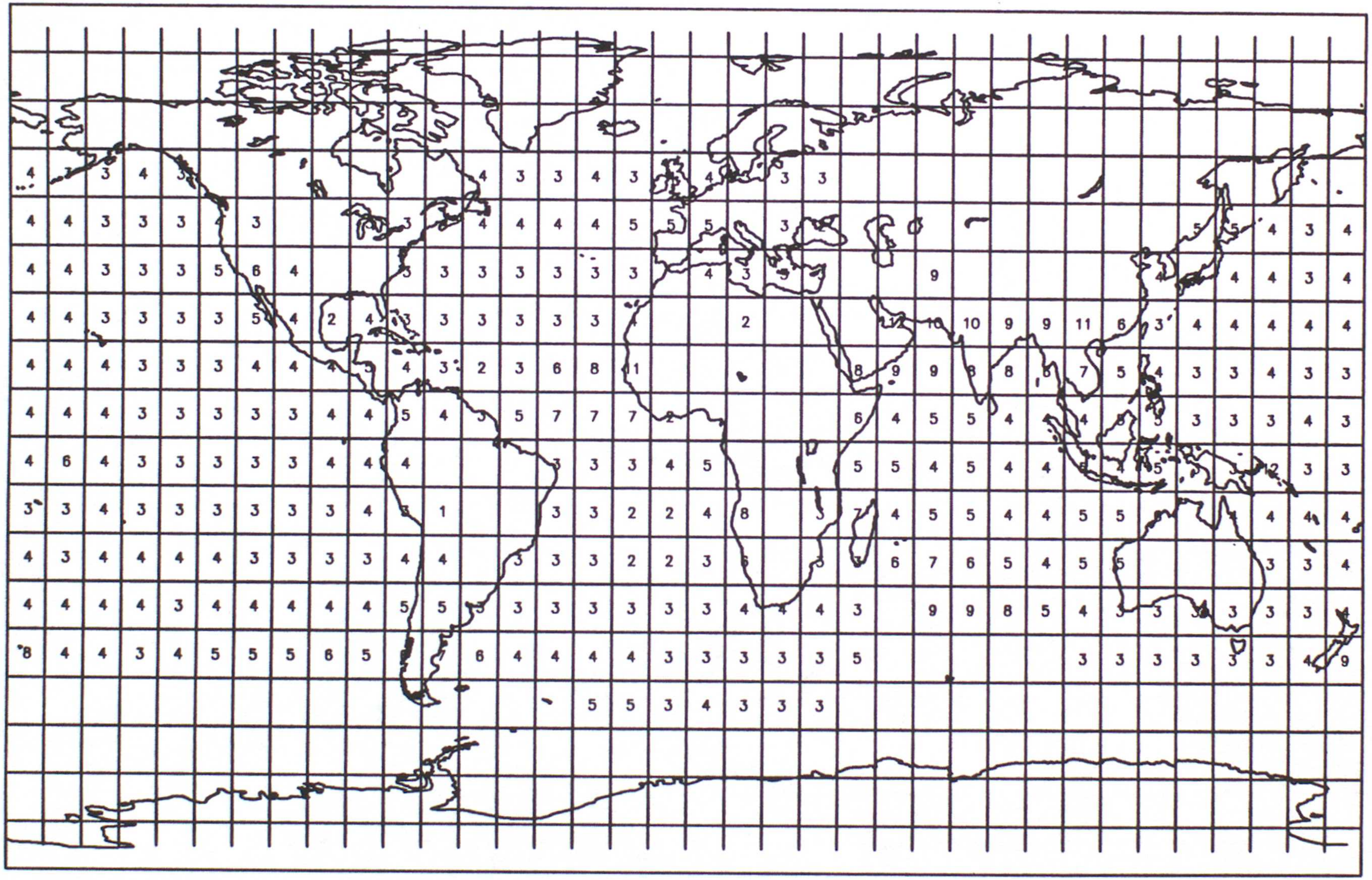
FIGURE 12



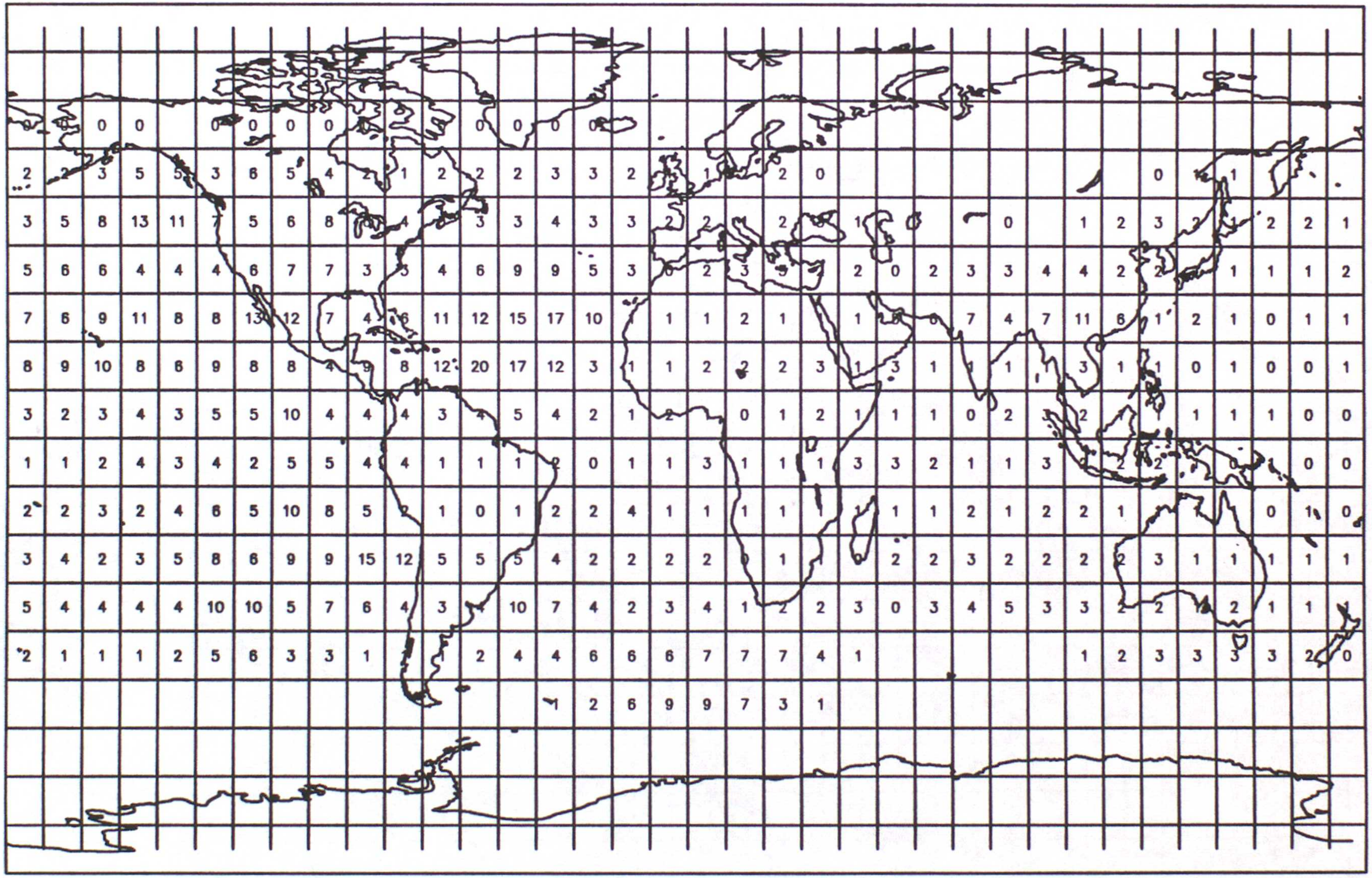
SATOBS : MEAN O–B SPEED DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 13
MARCH 1997
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


1.2 .9 .8 1.4 .7 .4 .4 .5 –.1 .3 –2.0 –1.3 –1.4
.4 .0 .1 .4 –.4 –1.2 –2.4 –1.2 –.6 –.5 –.6 –.1 .9 –.9 –2.4 –1.0 –1.3 –.4 –.5 –.3
–.1 .5 .2 .1 .6 –1.7 –4.5 –2.4 .1 –.3 –.5 –.2 –.2 .0 –.1 –.7 –.3 –1.0 –1.3 4.8 –.2 .3 .3 –.2
1.0 1.1 .7 .7 .9 .5 –2.7 –1.6 –1.8 .2 .5 .7 .2 .3 –.2 –.2 –.3 .1 8.7 7.1 8.2 6.8 5.2 7.5 2.4 1.0 .8 1.3 1.0 1.1 .4
.3 .4 .6 .4 .8 .5 –.4 –.3 .1 –.7 –.1 .1 .1 .1 .7 1.5 2.4 1.5 4.7 6.7 4.5 5.9 2.9 3.5 2.1 .7 1.0 1.0 .9 .6 .8
.1 –.7 .1 .2 .2 –.9 –.2 .3 .1 .1 1.6 2.5 2.1 –.2 .0 1.3 1.8 1.0 3.3 .7 2.8 3.6 2.1 1.6 1.1 2.1 2.0 .7 .7 .8 1.3 .4
.1 .4 –1.5 –.4 –.4 .1 –.5 .1 .9 1.1 .3 .5 .1 –.1 .3 1.1 1.4 2.0 1.8 2.7 2.4 1.3 1.7 .5 1.3 .4 .2 –.2
–.5 –.4 –.7 –.1 .0 .4 .9 .7 1.1 1.5 –.3 –1.2 –.4 –.7 –.3 –.1 .4 1.2 .0 1.6 –.3 2.4 2.4 1.6 1.7 2.0 2.2 1.0 .9 1.1 .9
.6 –.3 –.7 –.8 .1 .2 .5 .6 .0 .2 1.1 –2.0 .5 .0 –.2 –.1 –.2 .3 2.2 .0 2.7 4.4 4.2 3.5 1.4 2.1 2.4 .6 1.0 .1
.2 –.1 –.2 .1 .1 –.3 –.2 –.5 –.2 .4 –.7 –3.0 .3 .0 .0 .4 .2 –.3 –.1 .6 .3 .3 5.5 5.0 4.0 1.4 1.2 .5 .4 .5 .7 .2 .4
.7 .4 –.2 –.4 –.1 –.8 –.4 –1.0 –1.3 –.2 –1.5 –.3 –.1 –.2 –.5 –.3 –1.4 –.3 –1.0 –.9 –.1 –.4 –.7 –.1 .0 .0 .2 .3 .6 .2 1.5
–1.6 –2.6 –.5 –.3 –.5 –.6 –.8

SATOBS : RMS O–B VECTOR DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 14
MARCH 1997
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT

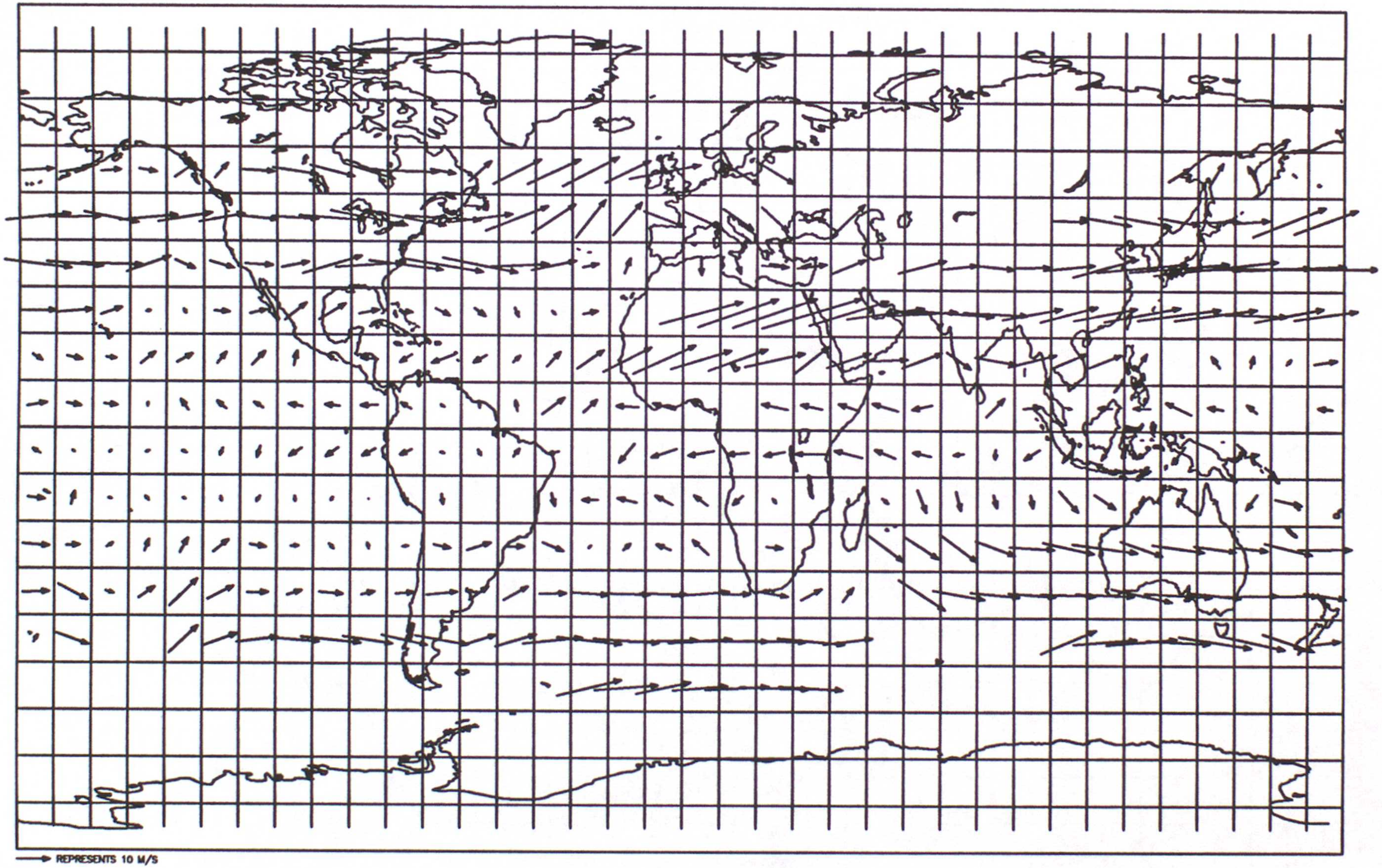

4 3 3 4 3 4 3 3 4 3 4 3 3
4 4 3 3 3 4 3 3 4 4 4 4 5 5 5 3 5 5 4 3 4
4 4 3 3 3 5 6 4 3 3 3 3 3 3 3 4 3 3 4 9 4 4 4 3 4
4 4 3 3 3 3 5 4 2 4 3 3 3 3 3 3 2 12 10 10 9 9 11 6 3 4 4 4 4 4
4 4 4 3 3 3 4 4 4 5 4 3 2 3 6 8 11 8 9 9 8 8 8 7 5 4 3 3 4 3 3
4 4 4 3 3 3 3 3 4 4 5 4 5 5 7 7 7 2 6 4 5 5 4 4 4 8 5 3 3 3 4 3
4 6 4 3 3 3 3 3 4 4 4 3 3 3 4 5 5 5 4 5 4 4 8 4 5 12 3 3
3 3 4 3 3 3 3 3 3 4 3 1 3 3 2 2 4 8 3 7 4 5 5 4 4 5 5 8 4 4 4 4
4 3 4 4 4 4 3 3 3 3 4 4 3 3 3 2 2 3 6 3 3 6 7 6 5 4 5 5 3 3 4
4 4 4 4 3 4 4 4 4 4 5 5 3 3 3 3 3 3 3 3 4 4 4 3 9 9 8 5 4 3 3 3 3 3 3 4
8 4 4 3 4 5 5 5 6 5 7 6 4 4 4 4 3 3 3 3 3 5 3 3 3 3 3 3 4 9
5 5 3 4 3 3 3

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 401 AND 700 HPA FIGURE 15
MARCH 1997



SATOB VECTOR MEAN WINDS BETWEEN 401–700 HPA
MARCH 1997
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 16


REPRESENTS 10 M/S

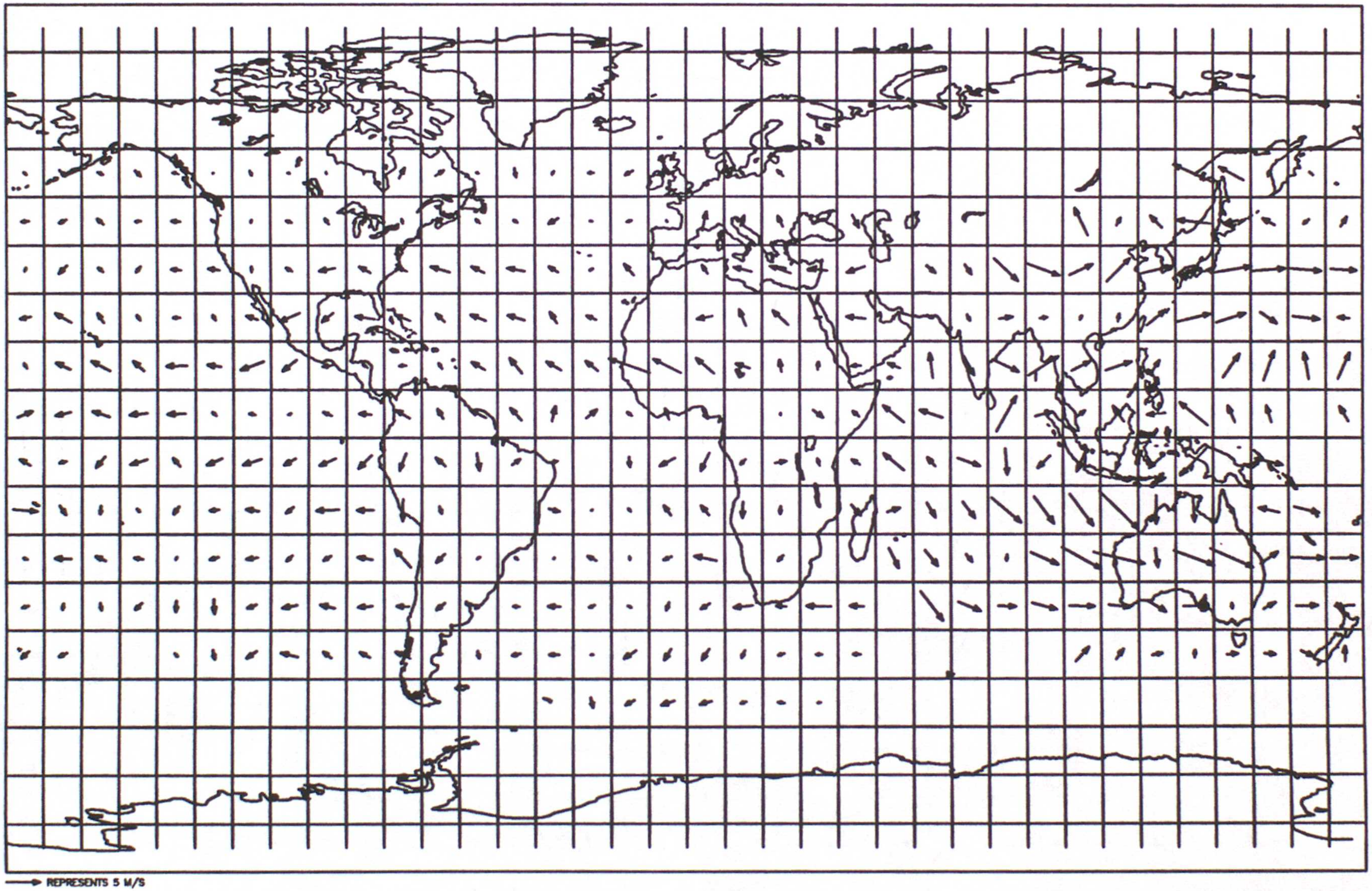
SATOB O−B VECTOR WIND DIFFERENCES BETWEEN 401−700 HPA

MARCH 1997

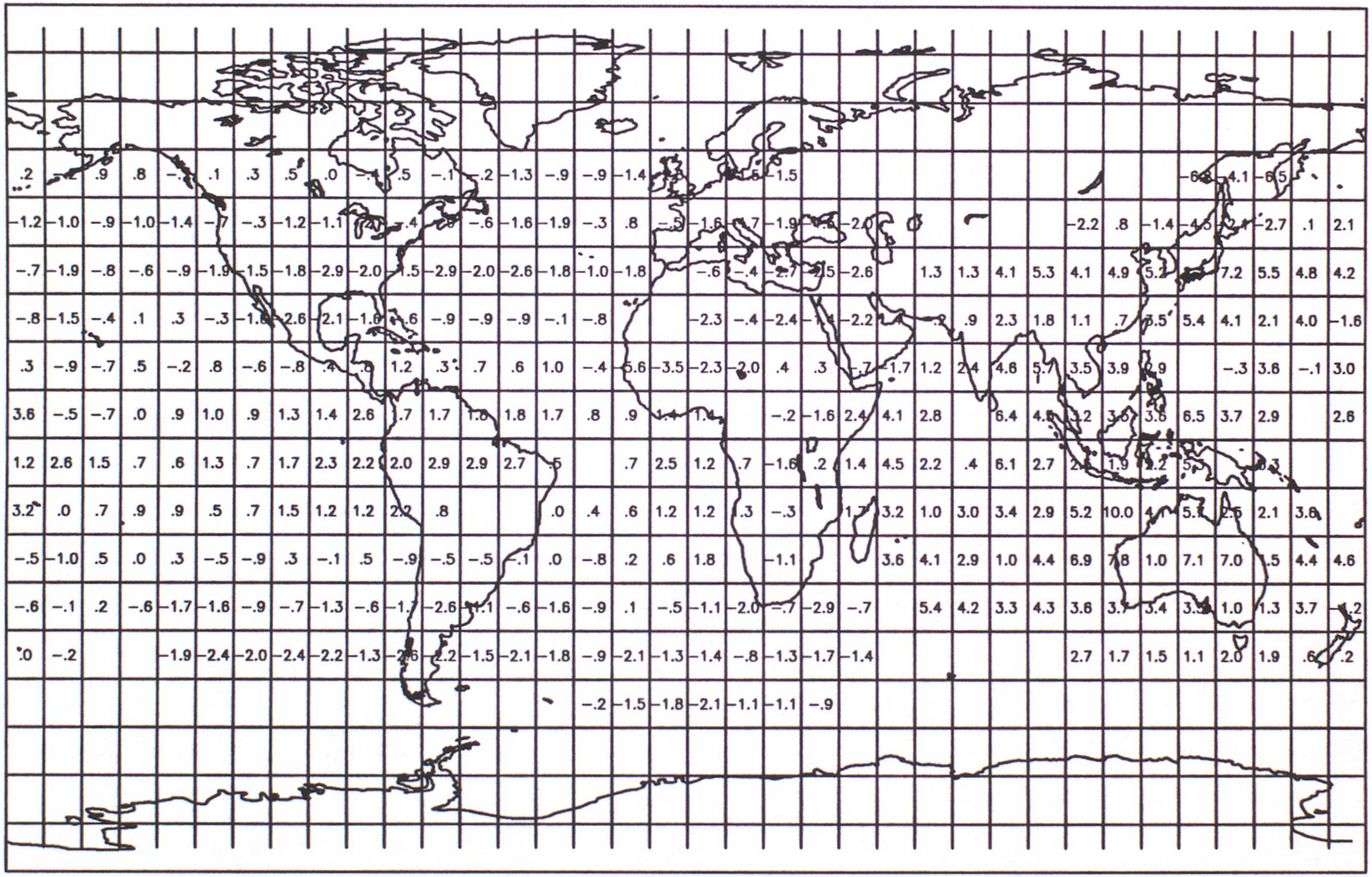
ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

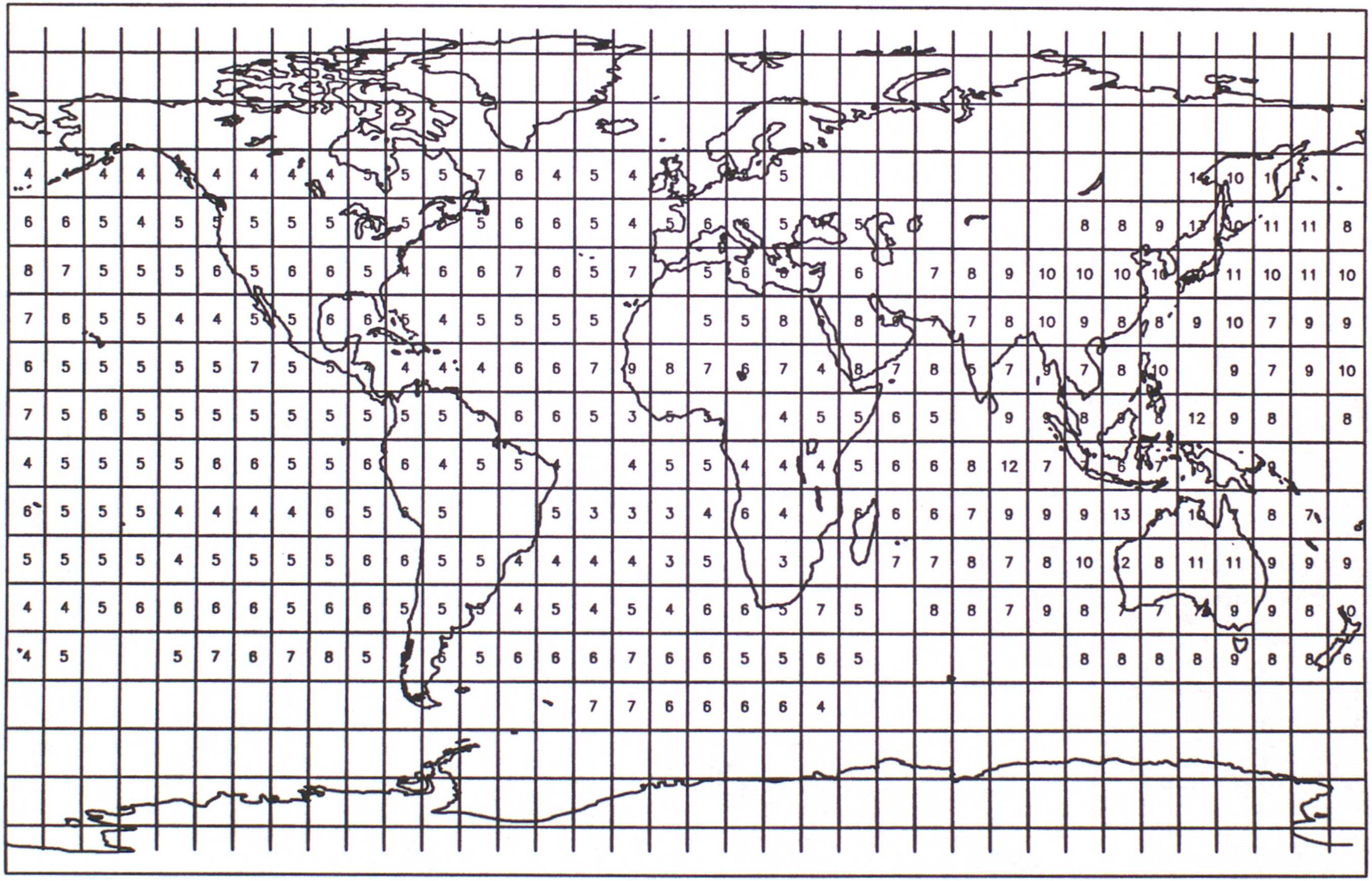
FIGURE 17


REPRESENTS 5 M/S

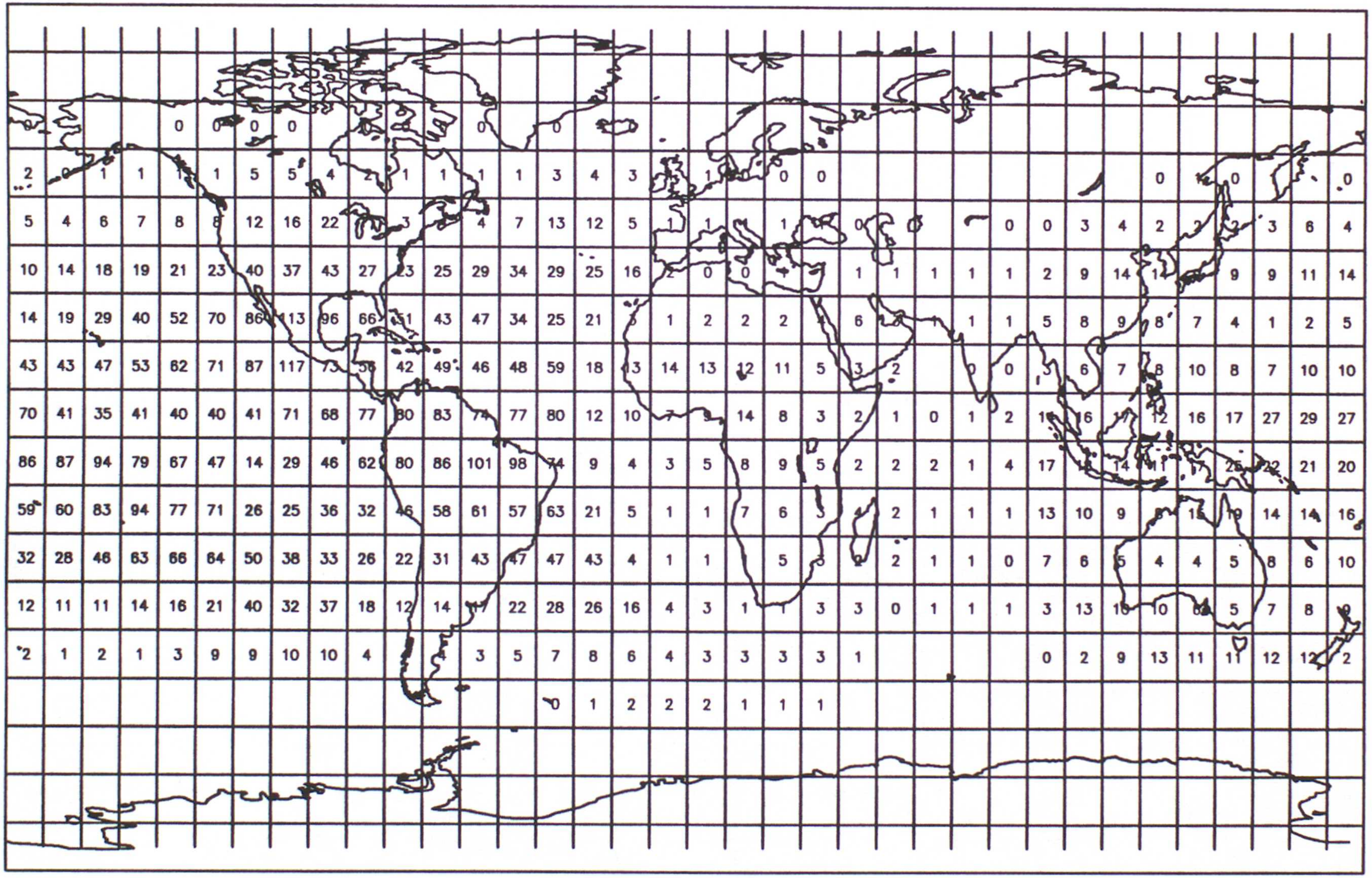
SATOBS : MEAN O–B SPEED DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 18
MARCH 1997
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


.2 .9 .8 .1 .3 .5 .0 .5 −.1 −.2 −1.3 −.9 −.9 −1.4 .5 −1.5 −6.3 −4.1 −6.5
−1.2 −1.0 −.9 −1.0 −1.4 −.7 −.3 −1.2 −1.1 −.4 −.6 −1.6 −1.9 −.3 .8 −.5 −1.6 −.7 −1.9 −2.0 −2.2 .8 −1.4 −4.5 −2.7 .1 2.1
−.7 −1.9 −.8 −.6 −.9 −1.9 −1.5 −1.8 −2.9 −2.0 −1.5 −2.9 −2.0 −2.6 −1.8 −1.0 −1.8 −.6 −.4 −2.7 −2.5 −2.6 1.3 1.3 4.1 5.3 4.1 4.9 5.2 7.2 5.5 4.8 4.2
−.8 −1.5 −.4 .1 .3 −.3 −1.6 −2.6 −2.1 −1.6 −.6 −.9 −.9 −.9 −.1 −.8 −2.3 −.4 −2.4 −1.4 −2.2 .9 2.3 1.8 1.1 .7 3.5 5.4 4.1 2.1 4.0 −1.6
.3 −.9 −.7 .5 −.2 .8 −.6 −.8 .4 .8 1.2 .3 .7 .6 1.0 −.4 −5.6 −3.5 −2.3 −2.0 .4 .3 −.7 −1.7 1.2 2.4 4.6 5.7 3.5 3.9 2.9 −.3 3.6 −.1 3.0
3.6 −.5 −.7 .0 .9 1.0 .9 1.3 1.4 2.6 .7 1.7 1.8 1.8 1.7 .8 .9 1.4 1.4 −.2 −1.6 2.4 4.1 2.8 6.4 4.8 3.2 3.6 3.6 6.5 3.7 2.9 2.6
1.2 2.6 1.5 .7 .6 1.3 .7 1.7 2.3 2.2 2.0 2.9 2.9 2.7 .5 .7 2.5 1.2 .7 −1.6 .2 1.4 4.5 2.2 .4 6.1 2.7 2.4 1.9 2.2 5.3 3.3
3.2 .0 .7 .9 .9 .5 .7 1.5 1.2 1.2 2.2 .8 .0 .4 .6 1.2 1.2 1.3 −.3 1.7 3.2 1.0 3.0 3.4 2.9 5.2 10.0 4.1 5.1 2.5 2.1 3.6
−.5 −1.0 .5 .0 .3 −.5 −.9 .3 −.1 .5 −.9 −.5 −.5 −.1 .0 −.8 .2 .6 1.8 −1.1 3.6 4.1 2.9 1.0 4.4 6.9 7.8 1.0 7.1 7.0 .5 4.4 4.6
−.6 −.1 .2 −.6 −1.7 −1.6 −.9 −.7 −1.3 −.6 −1.7 −2.6 −1.1 −.6 −1.6 −.9 .1 −.5 −1.1 −2.0 −.7 −2.9 −.7 5.4 4.2 3.3 4.3 3.6 3.7 3.4 3.5 1.0 1.3 3.7 −1.2
.0 −.2 −1.9 −2.4 −2.0 −2.4 −2.2 −1.3 −2.6 −2.2 −1.5 −2.1 −1.8 −.9 −2.1 −1.3 −1.4 −.8 −1.3 −1.7 −1.4 2.7 1.7 1.5 1.1 2.0 1.9 .6 .2
−.2 −1.5 −1.8 −2.1 −1.1 −1.1 −.9

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 19
MARCH 1997
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


4 4 4 4 4 4 4 4 5 5 5 7 6 4 5 4 5 5 14 10 11
6 6 5 4 5 5 5 5 5 5 5 6 6 5 4 5 6 6 5 5 8 8 9 13 10 11 11 8
8 7 5 5 5 6 5 6 6 5 4 6 6 7 6 5 7 5 6 6 6 7 8 9 10 10 10 10 11 10 11 10
7 6 5 5 4 4 5 5 6 6 5 4 5 5 5 5 5 5 5 8 8 8 7 7 8 10 9 8 8 9 10 7 9 9
6 5 5 5 5 5 7 5 5 4 4 4 4 6 6 7 9 8 7 6 7 4 8 7 8 5 7 9 7 8 10 9 7 9 10
7 5 6 5 5 5 5 5 5 5 5 5 5 6 6 5 3 5 3 4 5 5 6 5 9 9 8 8 8 12 9 8 8
4 5 5 5 5 6 6 5 5 6 6 4 5 5 4 4 5 5 4 4 4 5 6 6 8 12 7 7 6 7 10 9
6 5 5 5 4 4 4 4 6 5 6 5 5 3 3 3 4 6 4 6 6 6 7 9 9 9 13 8 10 7 8 7
5 5 5 5 4 5 5 5 5 6 6 5 5 4 4 4 4 3 5 3 7 7 8 7 8 10 12 8 11 11 9 9 9
4 4 5 6 6 6 6 5 6 6 5 5 5 4 5 4 5 4 6 6 5 7 5 8 8 7 9 8 7 7 7 9 9 8 10
4 5 5 7 6 7 8 5 6 5 6 6 6 7 6 6 5 5 6 5 8 8 8 8 9 8 8 6
7 7 6 6 6 6 4

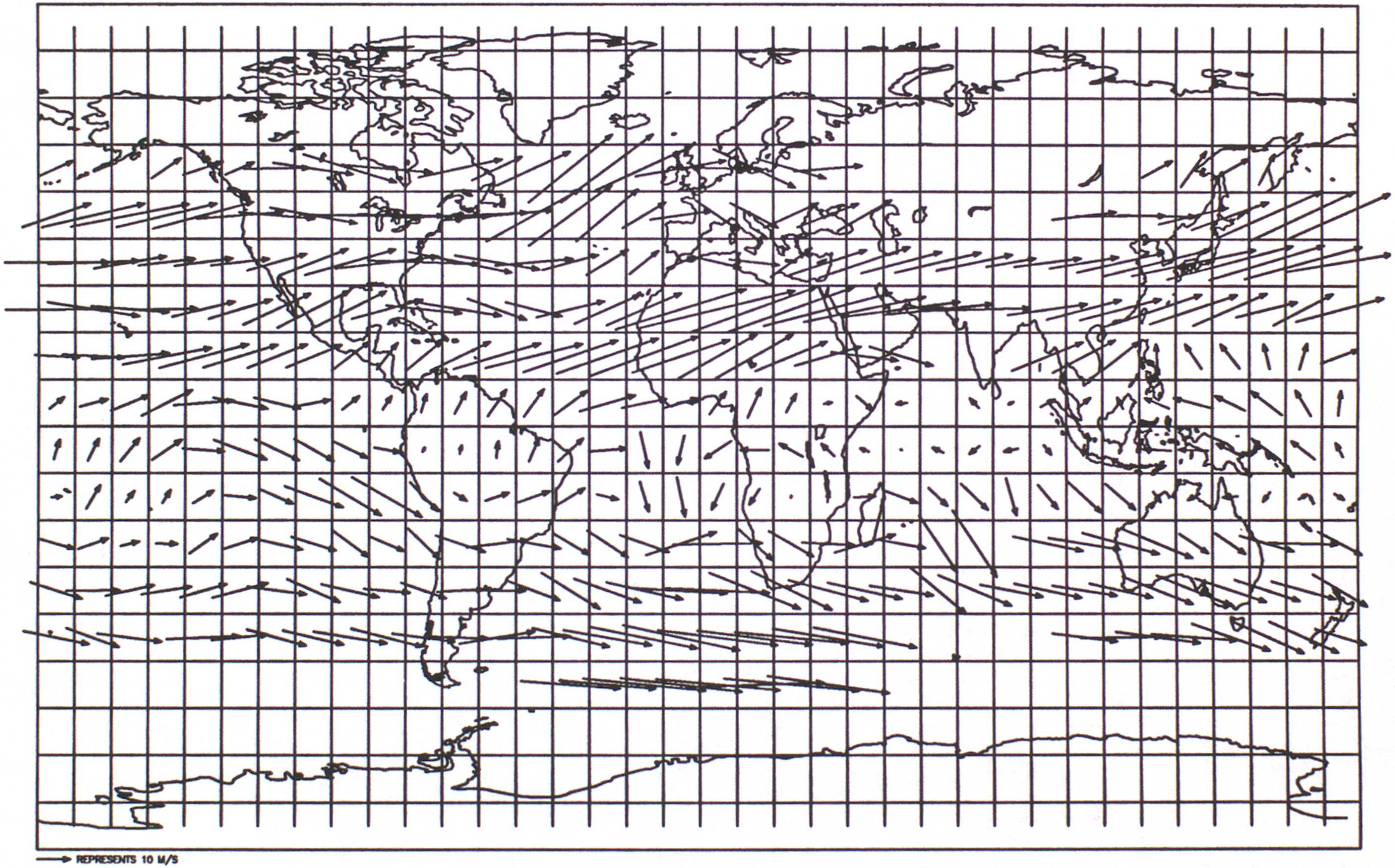
AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 101 AND 400 HPA FIGURE 20
MARCH 1997



0				0	0	0	0			0		0		0																					
2	0	1	1	1	1	5	5	4	2	1	1	1	1	3	4	3		1	0	0	0									0	[illegible]	0			0
5	4	6	7	8	8	12	16	22		3		4	7	13	12	5	1	1	1	1	1	0				0	0	3	4	2	2	2	3	6	4
10	14	18	19	21	23	40	37	43	27	23	25	29	34	29	25	16	2	0	0	1	1	1	1	1	1	1	2	9	14	14	[illegible]	9	9	11	14
14	19	29	40	52	70	86	113	96	66	51	43	47	34	25	21	5	1	2	2	2	4	6	[illegible]	1	1	1	5	8	9	8	7	4	1	2	5
43	43	47	53	62	71	87	117	73	58	42	49	46	48	59	18	13	14	13	12	11	5	3	2		0	0	3	6	7	8	10	8	7	10	10
70	41	35	41	40	40	41	71	68	77	80	83	74	77	80	12	10	7	9	14	8	3	2	1	0	1	2	[illegible]	16	17	12	16	17	27	29	27
86	87	94	79	67	47	14	29	46	62	80	86	101	98	74	9	4	3	5	8	9	5	2	2	2	1	4	17	18	14	11	17	25	22	21	20
59	60	83	94	77	71	26	25	36	32	46	58	61	57	63	21	5	1	1	7	6	3	4	2	1	1	1	13	10	9	8	15	19	14	14	16
32	28	46	63	66	64	50	38	33	26	22	31	43	47	47	43	4	1	1		5	3	2	2	1	1	0	7	6	5	4	4	5	8	6	10
12	11	11	14	16	21	40	32	37	18	12	14	17	22	28	26	16	4	3	1	1	3	3	0	1	1	1	3	13	10	10	[illegible]	5	7	8	9
2	1	2	1	3	9	9	10	10	4		4	3	5	7	8	6	4	3	3	3	3	1					0	2	9	13	11	11	12	12	2
														0	1	2	2	2	1	1	1														

SATOB VECTOR MEAN WINDS BETWEEN 101–400 HPA
MARCH 1997
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 21


REPRESENTS 10 M/S

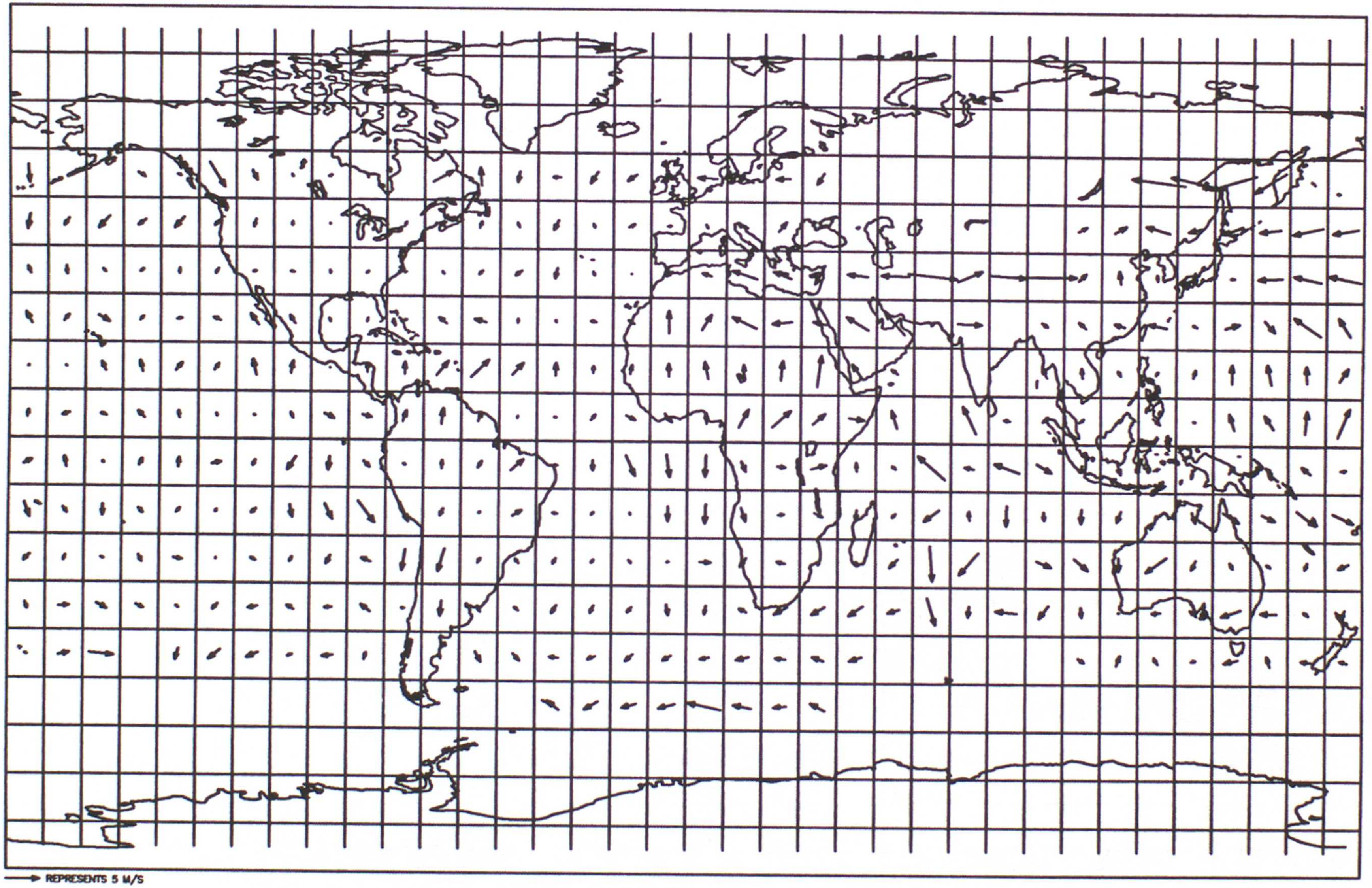
SATOB O–B VECTOR WIND DIFFERENCES BETWEEN 101–400 HPA

MARCH 1997

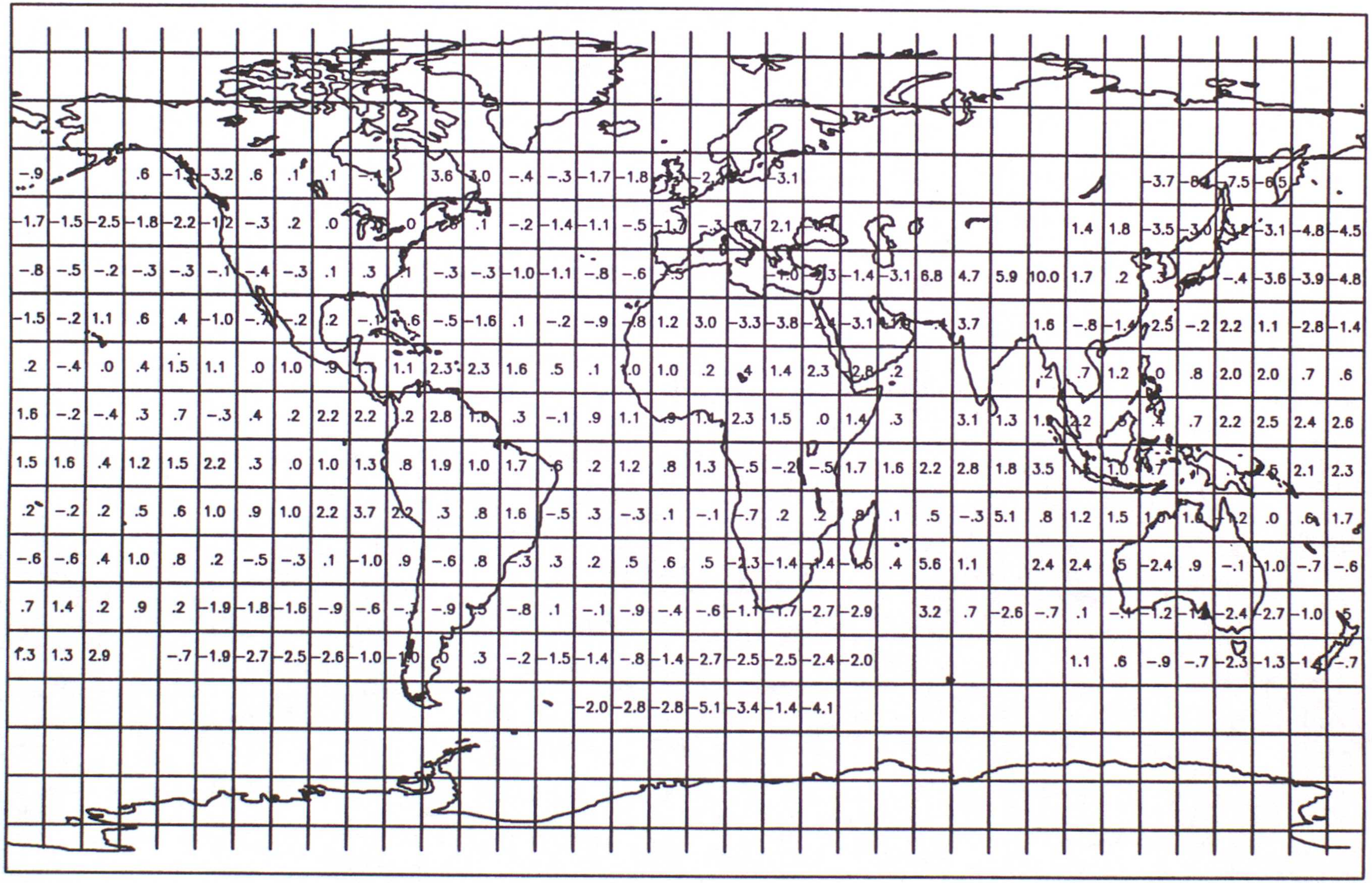
ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

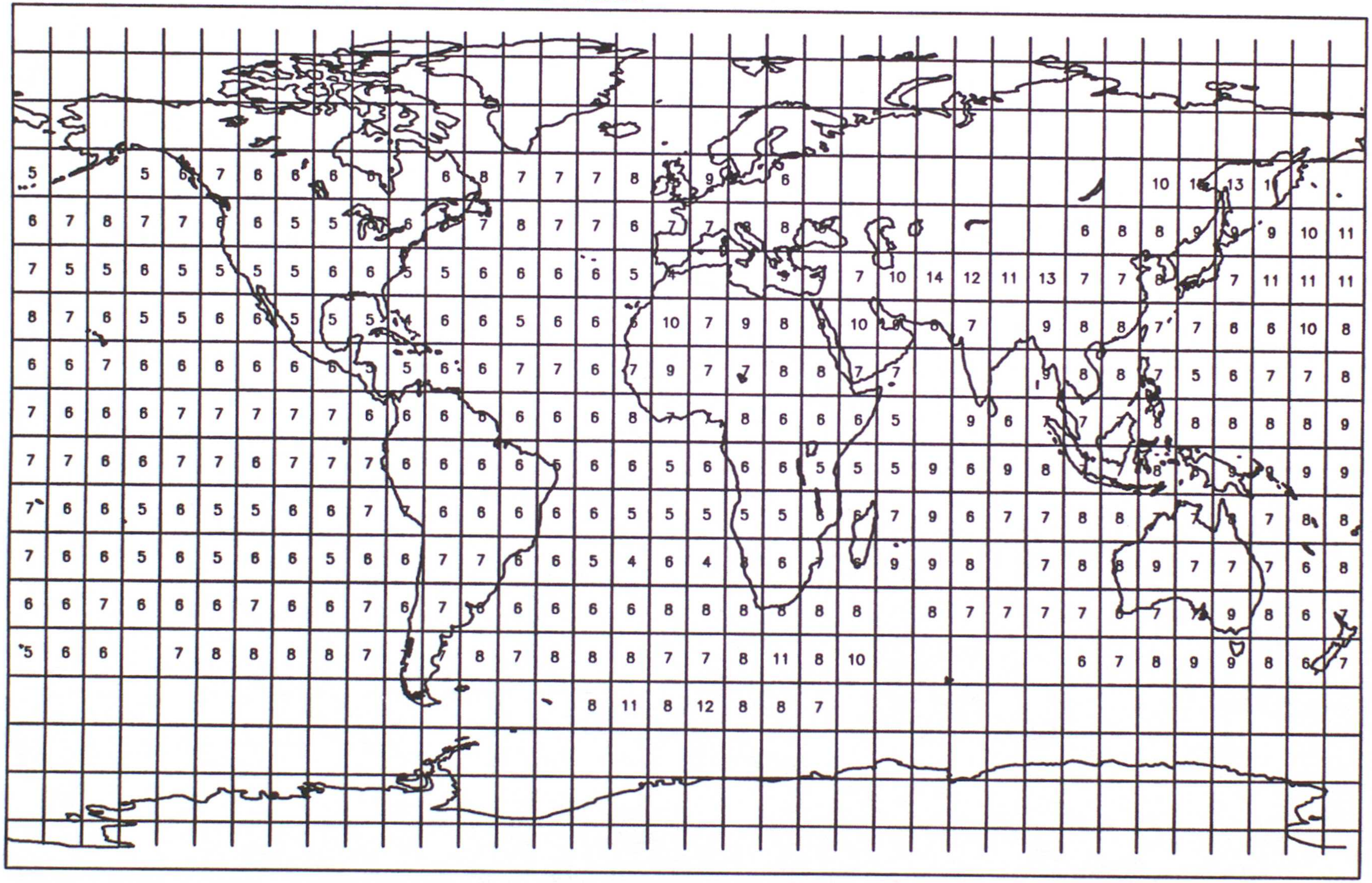
FIGURE 22


REPRESENTS 5 M/S

SATOBS : MEAN O–B SPEED DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 23
MARCH 1997
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


–.9 .6 –3.2 .6 .1 .1 3.6 3.0 –.4 –.3 –1.7 –1.8 –3.1 –3.7 –7.5 –6.5
–1.7 –1.5 –2.5 –1.8 –2.2 –1.2 –.3 .2 .0 .0 .1 –.2 –1.4 –1.1 –.5 –1.7 2.1 1.4 1.8 –3.5 –3.0 –3.1 –4.8 –4.5
–.8 –.5 –.2 –.3 –.3 –.1 –.4 –.3 .1 .3 .1 –.3 –.3 –1.0 –1.1 –.8 –.6 –1.0 –2.3 –1.4 –3.1 6.8 4.7 5.9 10.0 1.7 .2 .3 –.4 –3.6 –3.9 –4.8
–1.5 –.2 1.1 .6 .4 –1.0 –.7 –.2 .2 –.1 .6 –.5 –1.6 .1 –.2 –.9 –.8 1.2 3.0 –3.3 –3.8 –2.4 –3.1 3.7 1.6 –.8 –1.4 2.5 –.2 2.2 1.1 –2.8 –1.4
.2 –.4 .0 .4 1.5 1.1 .0 1.0 .9 1.1 2.3 2.3 1.6 .5 .1 1.0 1.0 .2 .4 1.4 2.3 2.8 .2 .2 .7 1.2 .0 .8 2.0 2.0 .7 .6
1.6 –.2 –.4 .3 .7 –.3 .4 .2 2.2 2.2 .2 2.8 1.6 .3 –.1 .9 1.1 .9 1.1 2.3 1.5 .0 1.4 .3 3.1 1.3 1.9 2.2 .4 .7 2.2 2.5 2.4 2.6
1.5 1.6 .4 1.2 1.5 2.2 .3 .0 1.0 1.3 .8 1.9 1.0 1.7 .6 .2 1.2 .8 1.3 –.5 –.2 –.5 1.7 1.6 2.2 2.8 1.8 3.5 1.0 .7 .5 2.1 2.3
.2 –.2 .2 .5 .6 1.0 .9 1.0 2.2 3.7 2.2 .3 .8 1.6 –.5 .3 –.3 .1 –.1 –.7 .2 .2 .8 .1 .5 –.3 5.1 .8 1.2 1.5 1.0 1.6 –1.2 .0 .6 1.7
–.6 –.6 .4 1.0 .8 .2 –.5 –.3 .1 –1.0 .9 –.6 .8 –.3 .3 .2 .5 .6 .5 –2.3 –1.4 –1.4 –1.6 .4 5.6 1.1 2.4 2.4 .5 –2.4 .9 –.1 –1.0 –.7 –.6
.7 1.4 .2 .9 .2 –1.9 –1.8 –1.6 –.9 –.6 –.9 –.8 .1 –.1 –.9 –.4 –.6 –1.1 –1.7 –2.7 –2.9 3.2 .7 –2.6 –.7 .1 –1.2 –2.4 –2.7 –1.0 .5
1.3 1.3 2.9 –.7 –1.9 –2.7 –2.5 –2.6 –1.0 –1.0 .0 .3 –.2 –1.5 –1.4 –.8 –1.4 –2.7 –2.5 –2.5 –2.4 –2.0 1.1 .6 –.9 –.7 –2.3 –1.3 –1.4 –.7
–2.0 –2.8 –2.8 –5.1 –3.4 –1.4 –4.1

SATOBS : RMS O–B VECTOR DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 24
MARCH 1997
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


5 5 6 7 6 6 6 6 6 8 7 7 7 8 9 6 10 13 1
6 7 8 7 7 6 6 5 5 6 7 8 7 7 6 7 7 8 8 6 8 8 9 9 9 10 11
7 5 5 6 5 5 5 5 6 6 5 5 6 6 6 6 5 4 7 10 14 12 11 13 7 7 8 7 11 11 11
8 7 6 5 5 6 6 5 5 5 4 6 6 5 6 6 6 10 7 9 8 10 6 7 9 8 8 7 7 6 6 10 8
6 6 7 6 6 6 6 6 6 5 5 6 6 7 7 6 7 9 7 7 8 8 7 7 9 8 8 7 5 6 7 7 8
7 6 6 6 7 7 7 7 7 6 6 6 6 6 6 6 8 7 8 6 6 6 5 9 6 7 7 8 8 8 8 8 9
7 7 6 6 7 7 6 7 7 7 6 6 6 6 5 6 6 5 6 6 6 5 5 5 9 6 9 8 8 9 9 9
7 6 6 5 6 5 5 6 6 7 7 6 6 6 6 6 5 5 5 5 5 6 6 7 9 6 7 7 8 8 7 7 7 8 8
7 6 6 5 6 5 6 6 5 6 6 7 7 6 6 5 4 6 4 6 6 7 6 9 9 8 7 8 8 9 7 7 7 6 8
6 6 7 6 6 6 7 6 6 7 6 7 6 6 6 6 6 8 8 8 8 8 8 8 7 7 7 7 6 7 7 9 8 6 7
5 6 6 7 8 8 8 8 7 7 7 8 7 8 8 8 7 7 8 11 8 10 6 7 8 9 9 8 6 7
8 11 8 12 8 8 7

MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: BRACKNELL

MONTH: March, 1997

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from NOAA-12, NOAA-14 500 km.

Standard of comparison :Background field from Bracknell global model.

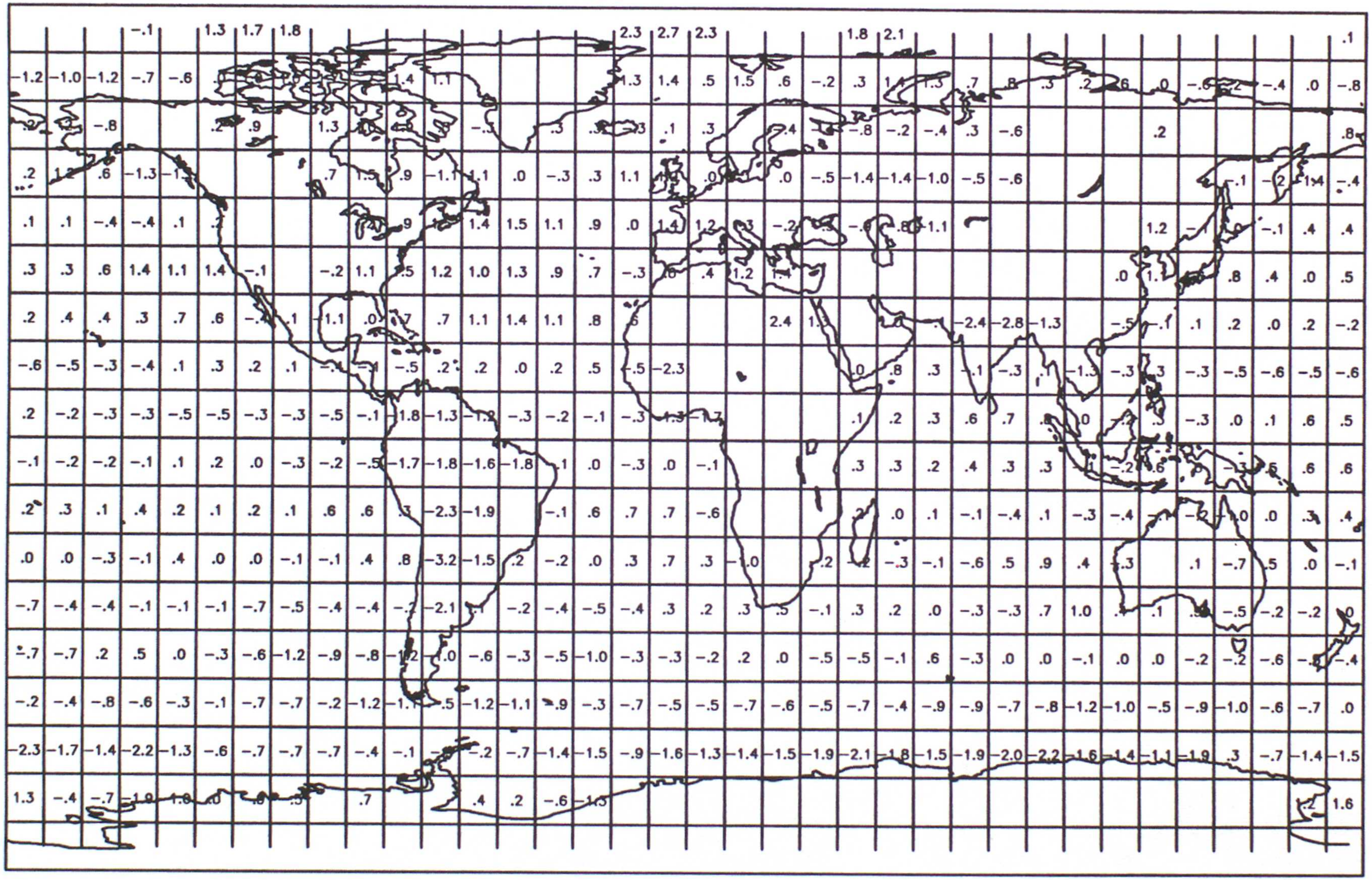
Selection Criteria :All SATEM soundings where number of observations > 30.

Data Extracted :Layer: 850 - 1000 hPa
100 - 300 hPa
30 - 50 hPa

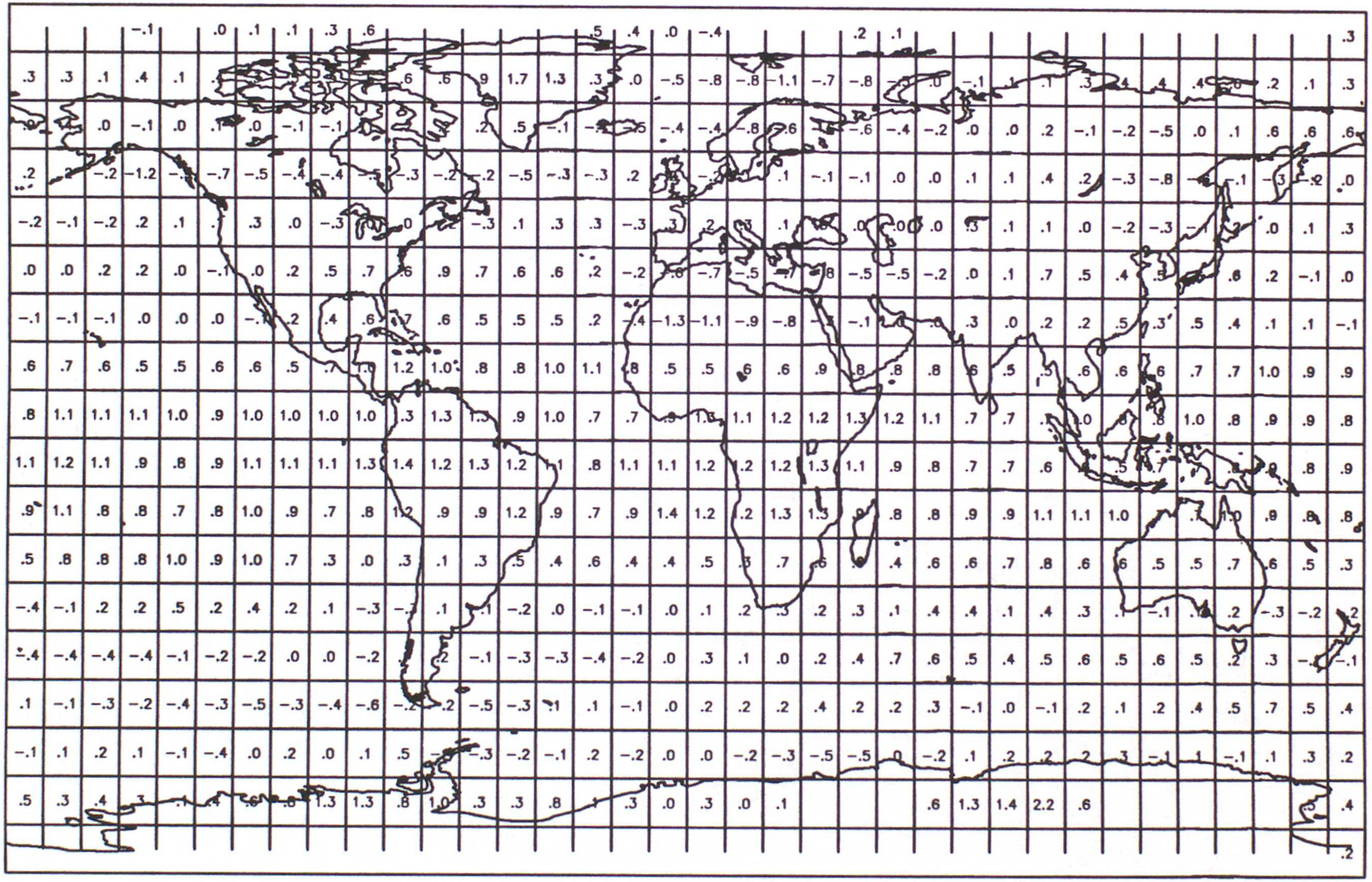
:Mean observation minus background temperature differences

500 KM SATEMS : MEAN O–B TEMPERATURE DIFFERENCES (DEG C) : 850 TO 1000 HPA
MARCH 1997
NOAA–12, USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

FIGURE 25

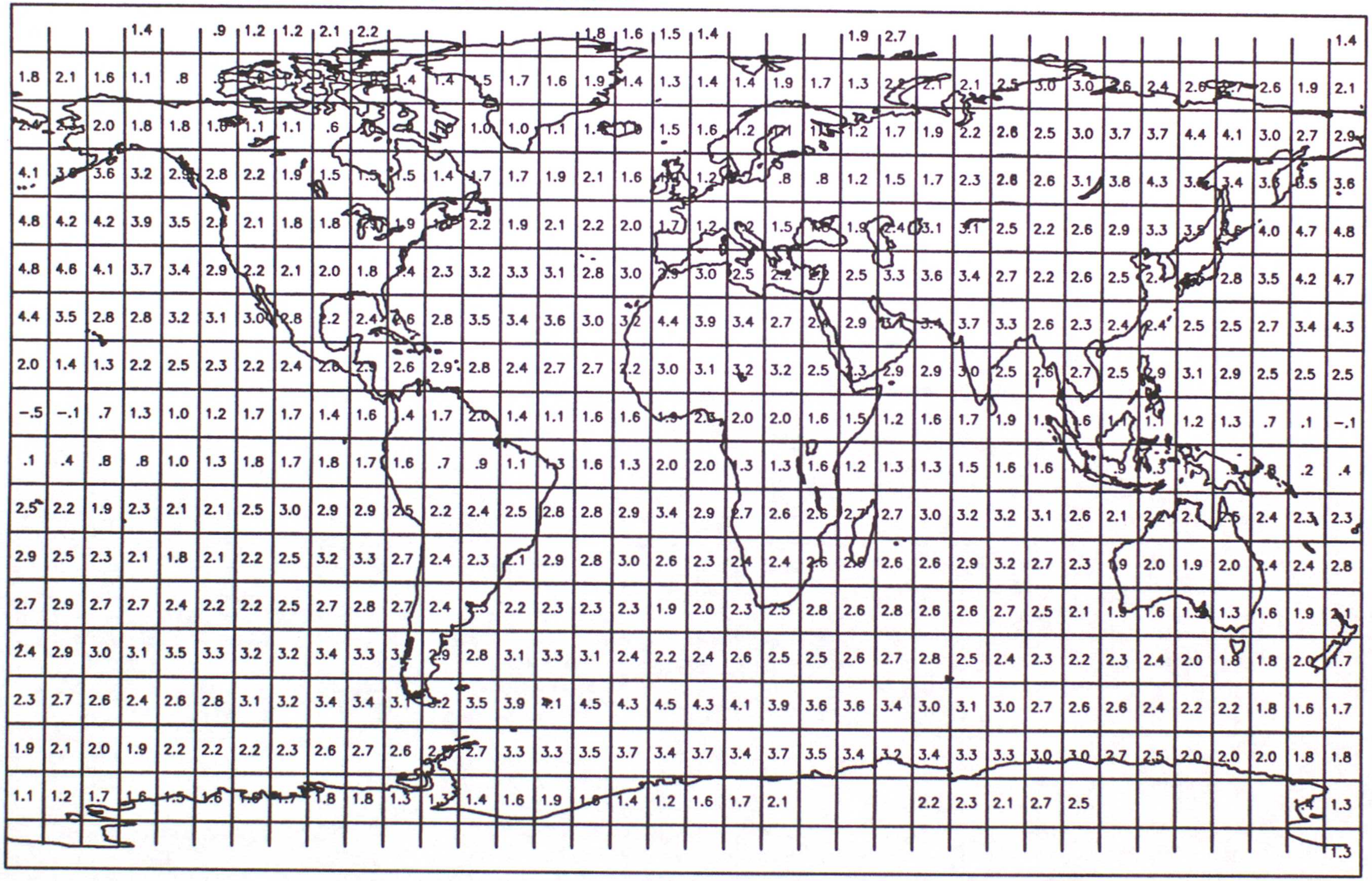


500 KM SATEMS : MEAN O–B TEMPERATURE DIFFERENCES (DEG C) : 100 TO 300 HPA
MARCH 1997
FIGURE 26
NOAA–12, USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT



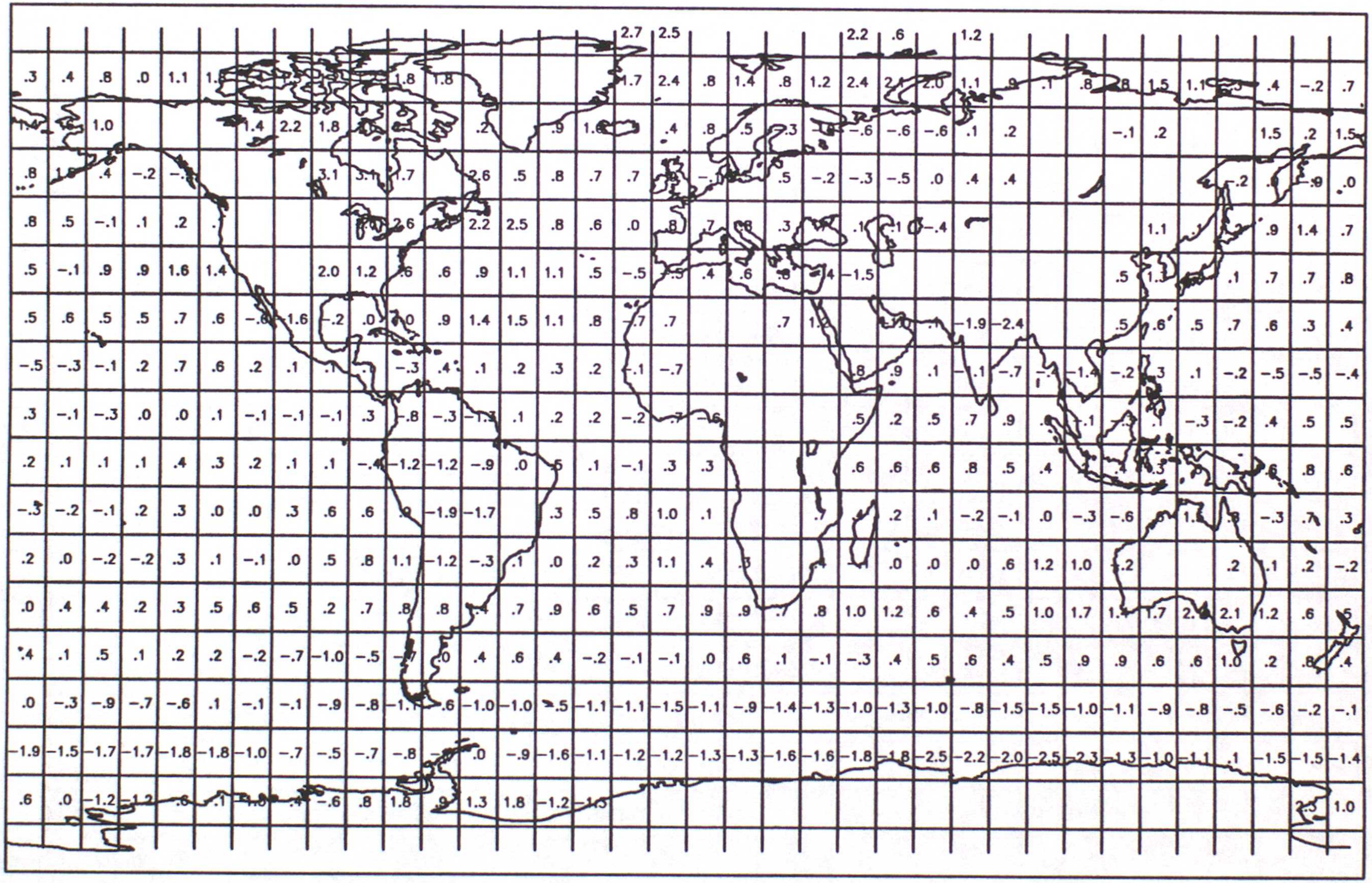
500 KM SATEMS : MEAN O–B TEMPERATURE DIFFERENCES (DEG C) : 30 TO 50 HPA
MARCH 1997
NOAA–12, USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

FIGURE 27

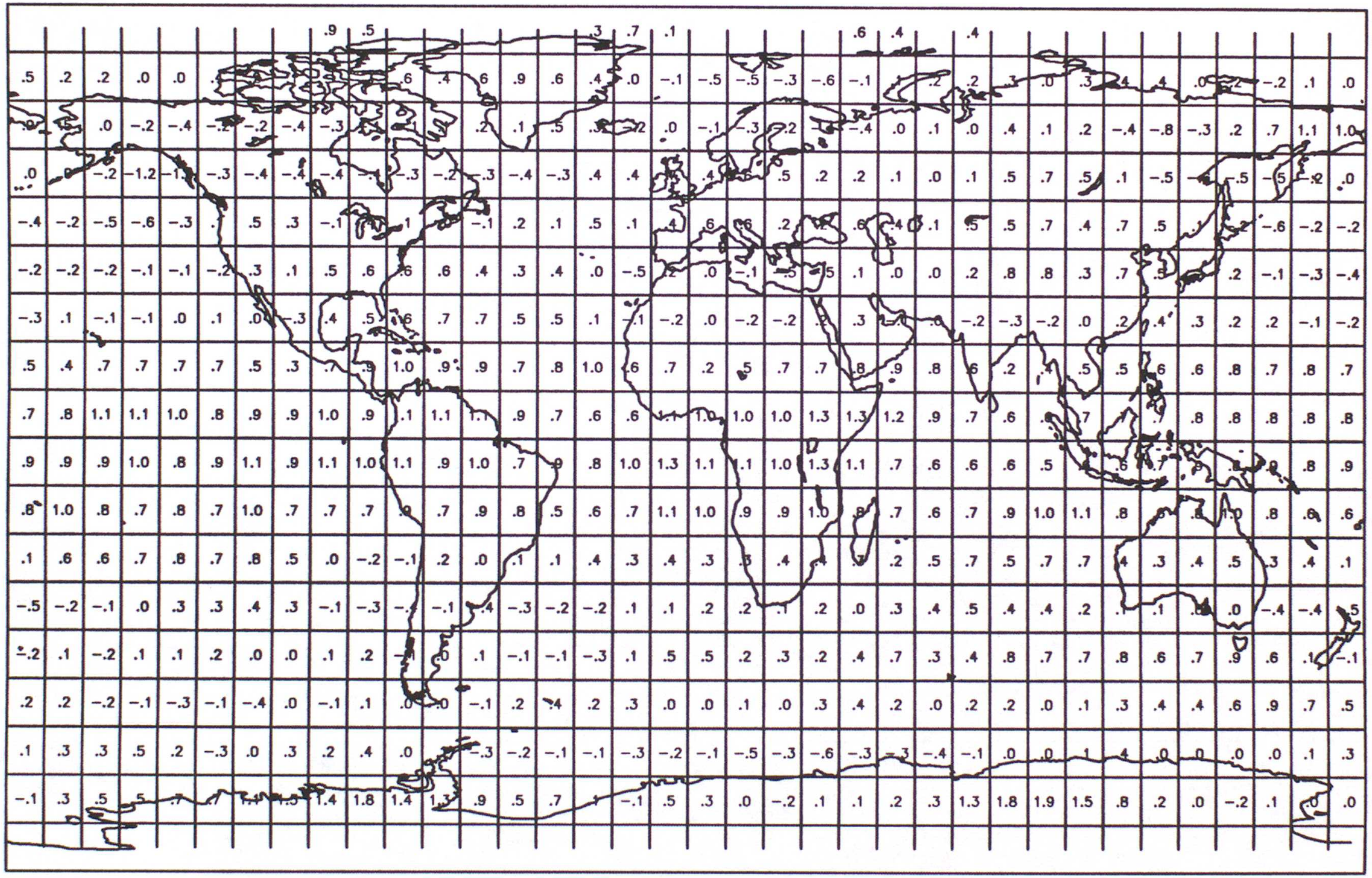

1.4 .9 1.2 1.2 2.1 2.2 1.8 1.6 1.5 1.4 1.9 2.7 1.4
1.8 2.1 1.6 1.1 .8 1.4 1.4 1.5 1.7 1.6 1.9 1.4 1.3 1.4 1.4 1.9 1.7 1.3 2.2 2.1 2.1 2.5 3.0 3.0 2.6 2.4 2.6 2.7 2.6 1.9 2.1
2.4 2.3 2.0 1.8 1.8 1.8 1.1 1.1 .6 1.0 1.0 1.1 1.4 1.5 1.6 1.2 1.1 1.5 1.2 1.7 1.9 2.2 2.8 2.5 3.0 3.7 3.7 4.4 4.1 3.0 2.7 2.9
4.1 3.6 3.6 3.2 2.9 2.8 2.2 1.9 1.5 1.5 1.5 1.4 1.7 1.7 1.9 2.1 1.6 1.4 1.2 .8 .8 1.2 1.5 1.7 2.3 2.8 2.6 3.1 3.8 4.3 3.6 3.4 3.6 3.5 3.6
4.8 4.2 4.2 3.9 3.5 2.8 2.1 1.8 1.8 1.9 2.2 1.9 2.1 2.2 2.0 1.7 1.2 1.2 1.5 1.6 1.9 2.4 3.1 3.1 2.5 2.2 2.6 2.9 3.3 3.5 3.6 4.0 4.7 4.8
4.8 4.6 4.1 3.7 3.4 2.9 2.2 2.1 2.0 1.8 2.4 2.3 3.2 3.3 3.1 2.8 3.0 2.9 3.0 2.5 2.2 2.2 2.5 3.3 3.6 3.4 2.7 2.2 2.6 2.5 2.4 2.8 3.5 4.2 4.7
4.4 3.5 2.8 2.8 3.2 3.1 3.0 2.8 2.2 2.4 2.6 2.8 3.5 3.4 3.6 3.0 3.2 4.4 3.9 3.4 2.7 2.4 2.9 3.1 3.4 3.7 3.3 2.6 2.3 2.4 2.4 2.5 2.5 2.7 3.4 4.3
2.0 1.4 1.3 2.2 2.5 2.3 2.2 2.4 2.6 2.5 2.6 2.9 2.8 2.4 2.7 2.7 2.2 3.0 3.1 3.2 3.2 2.5 1.3 2.9 2.9 3.0 2.5 2.6 2.7 2.5 2.9 3.1 2.9 2.5 2.5 2.5
–.5 –.1 .7 1.3 1.0 1.2 1.7 1.7 1.4 1.6 1.4 1.7 2.0 1.4 1.1 1.6 1.6 1.9 2.6 2.0 2.0 1.6 1.5 1.2 1.6 1.7 1.9 1.6 1.6 1.1 1.1 1.2 1.3 .7 .1 –.1
.1 .4 .8 .8 1.0 1.3 1.8 1.7 1.8 1.7 1.6 .7 .9 1.1 1.3 1.6 1.3 2.0 2.0 1.3 1.3 1.6 1.2 1.3 1.3 1.5 1.6 1.6 .9 .3 .8 .2 .4
2.5 2.2 1.9 2.3 2.1 2.1 2.5 3.0 2.9 2.9 2.5 2.2 2.4 2.5 2.8 2.8 2.9 3.4 2.9 2.7 2.6 2.6 2.7 2.7 3.0 3.2 3.2 3.1 2.6 2.1 2.2 2.5 2.4 2.3 2.3
2.9 2.5 2.3 2.1 1.8 2.1 2.2 2.5 3.2 3.3 2.7 2.4 2.3 2.1 2.9 2.8 3.0 2.6 2.3 2.4 2.4 2.6 2.6 2.6 2.6 2.9 3.2 2.7 2.3 1.9 2.0 1.9 2.0 2.4 2.4 2.8
2.7 2.9 2.7 2.7 2.4 2.2 2.2 2.5 2.7 2.8 2.7 2.4 2.3 2.2 2.3 2.3 2.3 1.9 2.0 2.3 2.5 2.8 2.6 2.8 2.6 2.6 2.7 2.5 2.1 1.5 1.6 1.5 1.3 1.6 1.9 2.1
2.4 2.9 3.0 3.1 3.5 3.3 3.2 3.2 3.4 3.3 3.2 2.9 2.8 3.1 3.3 3.1 2.4 2.2 2.4 2.6 2.5 2.5 2.6 2.7 2.8 2.5 2.4 2.3 2.2 2.3 2.4 2.0 1.8 1.8 2.0 1.7
2.3 2.7 2.6 2.4 2.6 2.8 3.1 3.2 3.4 3.4 3.1 3.2 3.5 3.9 4.1 4.5 4.3 4.5 4.3 4.1 3.9 3.6 3.6 3.4 3.0 3.1 3.0 2.7 2.6 2.6 2.4 2.2 2.2 1.8 1.6 1.7
1.9 2.1 2.0 1.9 2.2 2.2 2.2 2.3 2.6 2.7 2.6 2.7 2.7 3.3 3.3 3.5 3.7 3.4 3.7 3.4 3.7 3.5 3.4 3.2 3.4 3.3 3.3 3.0 3.0 2.7 2.5 2.0 2.0 2.0 1.8 1.8
1.1 1.2 1.7 1.6 1.5 1.6 1.6 1.7 1.8 1.8 1.3 1.3 1.4 1.6 1.9 1.8 1.4 1.2 1.6 1.7 2.1 2.2 2.3 2.1 2.7 2.5 1.4 1.3
1.3

500 KM SATEMS : MEAN O–B TEMPERATURE DIFFERENCES (DEG C) : 850 TO 1000 HPA
MARCH 1997
NOAA–14, USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

FIGURE 28


2.7 2.5 2.2 .6 1.2
.3 .4 .8 .0 1.1 1.8 1.8 1.7 2.4 .8 1.4 .8 1.2 2.4 2.0 1.1 .9 .1 .8 1.5 1.1 .4 −.2 .7
1.0 1.4 2.2 1.8 .2 .9 .4 .8 .5 −.6 −.6 −.6 .1 .2 −.1 .2 1.5 .2 1.5
.8 .4 −.2 3.1 3.1 1.7 2.6 .5 .8 .7 .7 .5 −.2 −.3 −.5 .0 .4 .4 −.2 .9 .0
.8 .5 −.1 .1 .2 2.6 2.2 2.5 .8 .6 .0 .8 .7 .3 .1 −.4 1.1 .9 1.4 .7
.5 −.1 .9 .9 1.6 1.4 2.0 1.2 .6 .9 1.1 1.1 .5 −.5 .4 .6 −1.5 .5 .1 .7 .7 .8
.5 .6 .5 .5 .7 .6 1.6 −.2 .0 .0 .9 1.4 1.5 1.1 .8 .7 .7 −1.9 −2.4 .5 .6 .5 .7 .6 .3 .4
−.5 −.3 −.1 .2 .7 .6 .2 .1 −.3 .4 .1 .2 .3 .2 −.1 −.7 .8 .9 .1 −.7 −1.4 −.2 .3 .1 −.2 −.5 −.5 −.4
.3 −.1 −.3 .0 .0 .1 −.1 −.1 −.1 .3 −.8 −.3 .1 .2 .2 −.2 .5 .2 .5 .7 .9 .1 −.3 −.2 .4 .5 .5
.2 .1 .1 .1 .4 .3 .2 .1 .1 −1.2 −1.2 −.9 .0 .1 −.1 .3 .3 .6 .6 .6 .8 .5 .4 .8 .6
−.3 −.2 −.1 .2 .3 .0 .0 .3 .6 .6 −1.9 −1.7 .3 .5 .8 1.0 .1 .2 .1 −.2 −.1 .0 −.3 −.6 1.5 −.3 .3
.2 .0 −.2 −.2 .3 .1 −.1 .0 .5 .8 1.1 −1.2 −.3 .1 .0 .2 .3 1.1 .4 .0 .0 .0 .6 1.2 1.0 .2 .2 .1 .2 −.2
.0 .4 .4 .2 .3 .5 .6 .5 .2 .7 .8 .8 .7 .9 .6 .5 .7 .9 .9 .7 .8 1.0 1.2 .6 .4 .5 1.0 1.7 1.7 2.1 1.2 .6
.4 .1 .5 .1 .2 .2 −.2 −.7 −1.0 −.5 .0 .4 .6 .4 −.2 −.1 −.1 .0 .6 .1 −.1 −.3 .4 .5 .6 .4 .5 .9 .9 .6 .6 1.0 .2 .4
.0 −.3 −.9 −.7 −.6 .1 −.1 −.1 −.9 −.8 .6 −1.0 −1.0 .5 −1.1 −1.1 −1.5 −1.1 −.9 −1.4 −1.3 −1.0 −1.3 −1.0 −.8 −1.5 −1.5 −1.0 −1.1 −.9 −.8 −.5 −.6 −.2 −.1
−1.9 −1.5 −1.7 −1.7 −1.8 −1.8 −1.0 −.7 −.5 −.7 −.8 .0 −.9 −1.6 −1.1 −1.2 −1.2 −1.3 −1.3 −1.6 −1.6 −1.8 −2.5 −2.2 −2.0 −2.5 −2.3 −1.3 −1.0 .1 −1.5 −1.5 −1.4
.6 .0 −1.2 .1 −.6 .8 1.8 .9 1.3 1.8 −1.2 1.0

500 KM SATEMS : MEAN O–B TEMPERATURE DIFFERENCES (DEG C) : 100 TO 300 HPA
MARCH 1997
FIGURE 29
NOAA–14, USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT



500 KM SATEMS : MEAN O–B TEMPERATURE DIFFERENCES (DEG C) : 30 TO 50 HPA
MARCH 1997
FIGURE 30
NOAA–14, USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

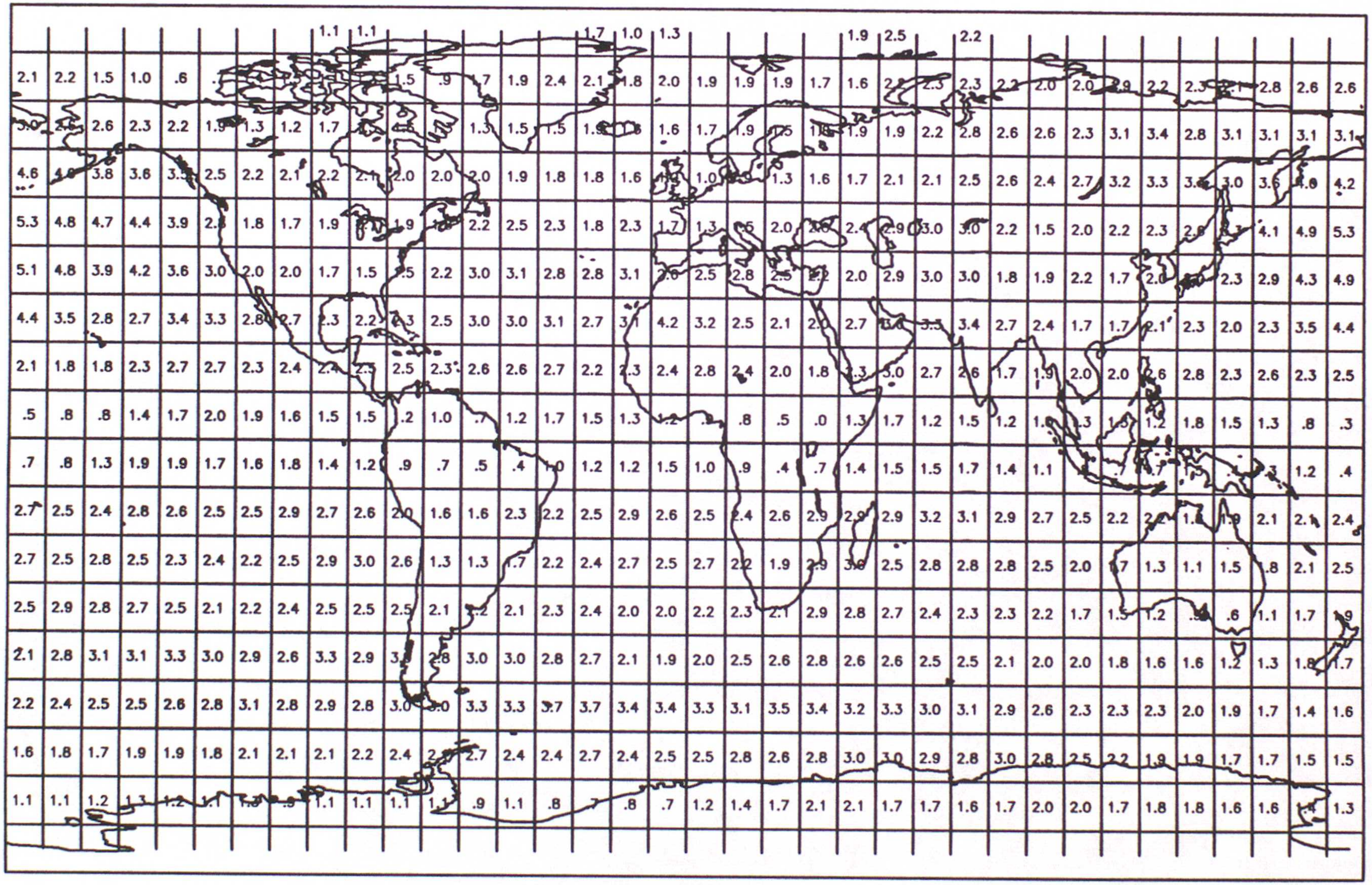


TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: BRACKNELL
MONTH: March, 1997

Monitoring procedures
Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoy.

Area monitored :10°N - 80°N, 85°W - 0°W

Standard of comparison :Background field from Bracknell global model.

Position :Average latitude and longitude for period.

Observation times :All hours combined.

Elements monitored :Mean sea-level pressure (hPa)
:Wind speed (m s^{-1})
:Wind direction (degrees)

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. A positive bias indicates the observation is veered to the background

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors

GROSS ERROR LIMITS :15 hPa (pressure)
:25 m s^{-1} (Vector Wind)

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
12521	44.7	-63.6	ALL	MSLP	SUR	11	0	0	2.8	-3.8	4.7
13903	25.5	-34.6	ALL	MSLP	SUR	231	0	0	0.9	0.6	1.1
13905	23.7	-44.4	ALL	MSLP	SUR	248	0	0	1.0	0.2	1.0
13906	15.6	-45.8	ALL	MSLP	SUR	263	0	0	1.2	0.5	1.3
13910	23.3	-43.5	ALL	MSLP	SUR	261	0	0	1.0	0.3	1.0
13911	25.3	-51.4	ALL	MSLP	SUR	274	0	0	1.1	0.6	1.2
13912	20.1	-59.7	ALL	MSLP	SUR	288	0	0	1.3	0.8	1.6
13913	17.2	-43.6	ALL	MSLP	SUR	249	0	0	1.1	0.6	1.3
13915	19.2	-43.6	ALL	MSLP	SUR	237	0	0	1.1	0.0	1.1
29703	41.5	-13.6	ALL	MSLP	SUR	1	0	0	0.0	-0.6	0.6
39705	40.9	-53.9	ALL	MSLP	SUR	1	0	0	0.0	-2.1	2.1
41501	35.3	-75.5	ALL	MSLP	SUR	491	0	0	1.4	-0.3	1.4
41502	35.2	-75.7	ALL	MSLP	SUR	567	0	0	1.4	-1.6	2.1
41503	35.3	-75.5	ALL	MSLP	SUR	304	0	0	1.3	0.5	1.3
41529	38.4	-38.5	ALL	MSLP	SUR	202	0	0	1.4	0.4	1.4
41530	33.3	-36.8	ALL	MSLP	SUR	208	0	0	1.2	0.2	1.2
41611	13.7	-53.8	ALL	MSLP	SUR	191	0	0	1.1	-0.3	1.2
41612	17.9	-56.0	ALL	MSLP	SUR	205	0	0	1.0	0.0	1.0
41613	17.2	-56.5	ALL	MSLP	SUR	193	0	0	1.0	-0.1	1.0
41922	23.3	-43.6	ALL	MSLP	SUR	258	0	0	1.0	1.1	1.5
41924	19.1	-54.8	ALL	MSLP	SUR	264	0	0	1.4	-0.3	1.4
44513	48.3	-26.8	ALL	MSLP	SUR	267	0	0	1.4	0.0	1.4
44601	48.2	-40.7	ALL	MSLP	SUR	134	25	19	7.0	-1.2	7.1
44605	46.7	-36.8	ALL	MSLP	SUR	621	1	0	2.2	0.5	2.3
44606	45.2	-34.7	ALL	MSLP	SUR	615	0	0	1.9	0.4	1.9
44607	49.3	-32.1	ALL	MSLP	SUR	649	0	0	2.0	0.7	2.1
44608	52.1	-32.2	ALL	MSLP	SUR	623	0	0	2.1	0.3	2.1
44613	53.1	-36.7	ALL	MSLP	SUR	458	12	3	3.1	-0.1	3.1
44614	65.5	-27.0	ALL	MSLP	SUR	1094	6	1	1.8	-0.3	1.8
44624	55.0	-27.3	ALL	MSLP	SUR	931	4	0	2.1	0.0	2.1
44726	56.7	-15.2	ALL	MSLP	SUR	897	1	0	1.6	0.3	1.7
44728	62.3	-23.9	ALL	MSLP	SUR	1058	0	0	1.8	0.5	1.8
44742	45.7	-28.4	ALL	MSLP	SUR	514	0	0	1.3	0.0	1.3
44743	50.6	-17.9	ALL	MSLP	SUR	652	5	1	1.4	0.3	1.4
44760	29.1	-62.2	ALL	MSLP	SUR	333	2	1	1.4	0.0	1.4
44762	43.8	-29.0	ALL	MSLP	SUR	496	0	0	1.2	0.1	1.2
44763	64.1	-21.5	ALL	MSLP	SUR	595	1	0	3.5	-4.4	5.6
44764	58.5	-27.3	ALL	MSLP	SUR	1022	185	18	3.3	-0.7	3.4
44766	57.4	-7.4	ALL	MSLP	SUR	605	2	0	2.3	-1.0	2.5
44767	63.8	-12.4	ALL	MSLP	SUR	1708	46	3	3.3	0.9	3.5
44768	55.9	-39.7	ALL	MSLP	SUR	301	0	0	2.1	-0.4	2.1
44770	29.9	-71.4	ALL	MSLP	SUR	575	6	1	1.1	0.4	1.2
44772	62.1	-7.2	ALL	MSLP	SUR	211	2	1	2.1	1.0	2.4
44775	58.2	-37.4	ALL	MSLP	SUR	337	0	0	1.6	-0.1	1.6
44776	56.0	-13.9	ALL	MSLP	SUR	924	3	0	1.6	0.4	1.6
44777	60.9	-6.2	ALL	MSLP	SUR	1019	2	0	2.0	0.5	2.0
44778	62.5	-10.5	ALL	MSLP	SUR	298	22	7	4.9	-1.7	5.2
44779	45.9	-39.7	ALL	MSLP	SUR	688	2	0	2.4	0.5	2.5
44780	55.0	-11.7	ALL	MSLP	SUR	571	0	0	1.3	0.2	1.3
44911	53.5	-26.7	ALL	MSLP	SUR	79	0	0	1.8	-0.1	1.8
44912	53.7	-50.5	ALL	MSLP	SUR	41	2	5	1.6	0.5	1.7
44917	57.8	-55.6	ALL	MSLP	SUR	44	4	9	3.5	1.5	3.8
44923	58.8	-51.7	ALL	MSLP	SUR	26	0	0	1.1	0.3	1.1
44925	57.6	-51.5	ALL	MSLP	SUR	22	1	5	3.0	1.1	3.2
47541	57.1	-58.5	ALL	MSLP	SUR	1	0	0	0.0	-1.2	1.2
61529	36.3	-4.9	ALL	MSLP	SUR	628	0	0	1.2	-0.3	1.2
62503	36.0	-14.6	ALL	MSLP	SUR	570	0	0	0.8	0.2	0.8
62507	35.3	-19.4	ALL	MSLP	SUR	588	0	0	1.0	0.5	1.1
62508	51.5	-14.5	ALL	MSLP	SUR	702	0	0	1.2	0.7	1.4
62510	38.7	-13.6	ALL	MSLP	SUR	1	0	0	0.0	1.1	1.1

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
62515	45.3	-13.6	ALL	MSLP	SUR	635	0	0	0.8	0.4	0.9
62517	50.5	-10.4	ALL	MSLP	SUR	368	0	0	1.1	0.6	1.2
62518	43.0	-17.1	ALL	MSLP	SUR	158	0	0	1.9	0.0	1.9
62551	45.5	-7.0	ALL	MSLP	SUR	573	0	0	0.7	0.5	0.9
62697	60.5	-19.7	ALL	MSLP	SUR	1106	7	1	1.8	0.6	1.9
62712	49.4	-31.6	ALL	MSLP	SUR	626	0	0	1.8	0.3	1.9
62713	43.6	-29.9	ALL	MSLP	SUR	660	2	0	1.5	0.4	1.5
62714	38.7	-27.1	ALL	MSLP	SUR	57	0	0	0.9	0.4	1.0
62803	57.3	-22.0	ALL	MSLP	SUR	1617	5	0	2.0	-0.1	2.0
62804	51.0	-18.1	ALL	MSLP	SUR	538	0	0	1.2	0.0	1.2
62927	47.6	-22.0	ALL	MSLP	SUR	127	0	0	1.5	1.3	2.0
62928	57.4	-28.3	ALL	MSLP	SUR	21	1	5	3.8	3.4	5.1
62929	58.9	-29.3	ALL	MSLP	SUR	38	6	16	3.2	2.1	3.8
64517	74.6	-5.4	ALL	MSLP	SUR	495	65	13	6.1	-2.9	6.7
64561	62.3	-38.8	ALL	MSLP	SUR	972	4	0	2.2	-0.5	2.2
64562	62.6	-22.8	ALL	MSLP	SUR	1450	1	0	1.8	0.0	1.8
65593	60.8	-27.1	ALL	MSLP	SUR	455	26	6	2.3	0.1	2.3
65594	61.6	-19.1	ALL	MSLP	SUR	1720	8	0	1.8	0.5	1.8
65595	62.9	-17.9	ALL	MSLP	SUR	1569	5	0	1.9	-0.3	2.0
65596	60.8	-55.2	ALL	MSLP	SUR	707	33	5	2.6	-1.1	2.8
65598	64.7	-29.2	ALL	MSLP	SUR	1494	11	1	2.2	-0.4	2.3
65599	53.3	-23.6	ALL	MSLP	SUR	1258	4	0	1.9	-0.1	1.9
WIND SPEED											
29703	41.5	-13.6	ALL	SPEED	SUR	1	0	0	0.0	5.3	5.3
39705	40.9	-53.9	ALL	SPEED	SUR	1	0	0	0.0	5.0	5.0
41530	33.3	-36.8	ALL	SPEED	SUR	204	0	0	2.7	-0.7	2.8
41611	13.7	-53.8	ALL	SPEED	SUR	191	0	0	1.3	0.1	1.3
41612	17.9	-56.0	ALL	SPEED	SUR	203	0	0	1.2	-1.9	2.2
41613	17.2	-56.5	ALL	SPEED	SUR	190	0	0	1.1	-1.3	1.7
44513	48.3	-26.8	ALL	SPEED	SUR	261	0	0	2.8	-3.7	4.7
44624	55.0	-27.3	ALL	SPEED	SUR	674	3	0	2.5	-1.2	2.8
44726	56.7	-15.2	ALL	SPEED	SUR	665	0	0	2.6	-1.5	3.0
44742	45.7	-28.4	ALL	SPEED	SUR	327	0	0	2.3	0.0	2.3
44762	43.8	-29.0	ALL	SPEED	SUR	323	0	0	2.1	-0.5	2.1
62518	43.0	-17.1	ALL	SPEED	SUR	496	0	0	1.7	-0.1	1.7
62551	45.5	-7.0	ALL	SPEED	SUR	324	0	0	1.6	0.1	1.6
62697	60.5	-19.7	ALL	SPEED	SUR	529	4	1	3.1	-1.1	3.2
62803	57.3	-22.0	ALL	SPEED	SUR	700	3	0	5.3	-6.6	8.5
64517	74.6	-5.4	ALL	SPEED	SUR	314	0	0	2.7	-1.1	2.9
WIND DIRECTION											
29703	41.5	-13.6	ALL	DIRN.	SUR	1	0	0	0.0	17.5	17.5
39705	40.9	-53.9	ALL	DIRN.	SUR	1	0	0	0.0	15.9	15.9
41530	33.3	-36.8	ALL	DIRN.	SUR	145	0	0	26.5	2.9	26.6
41611	13.7	-53.8	ALL	DIRN.	SUR	191	0	0	21.6	6.8	22.6
41612	17.9	-56.0	ALL	DIRN.	SUR	200	0	0	10.3	1.6	10.4
41613	17.2	-56.5	ALL	DIRN.	SUR	185	0	0	15.0	13.1	20.0
44513	48.3	-26.8	ALL	DIRN.	SUR	222	0	0	90.8	-48.4	102.9
44624	55.0	-27.3	ALL	DIRN.	SUR	640	3	0	24.5	18.4	30.6
44726	56.7	-15.2	ALL	DIRN.	SUR	618	0	0	22.5	-5.5	23.2
44742	45.7	-28.4	ALL	DIRN.	SUR	287	0	0	20.5	-8.0	22.0
44762	43.8	-29.0	ALL	DIRN.	SUR	284	0	0	25.9	-11.4	28.3
62518	43.0	-17.1	ALL	DIRN.	SUR	373	0	0	16.4	-11.2	19.8
62551	45.5	-7.0	ALL	DIRN.	SUR	191	0	0	20.8	1.1	20.9
62697	60.5	-19.7	ALL	DIRN.	SUR	508	4	1	34.4	0.8	34.4
62803	57.3	-22.0	ALL	DIRN.	SUR	628	3	0	62.8	17.9	65.3
64517	74.6	-5.4	ALL	DIRN.	SUR	269	0	0	49.3	-1.5	49.3

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: March, 1997

Monitoring procedures:

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :40°N - 70°N, 60°W - 0°W.

Standard of comparison :Background field from Bracknell global model.

Observation times :All hours combined.

Level(s) monitored :300.0 - 150.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored :N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	3765	0	2	1.9	0.0	3792	0	2	0	8.9	0.9
ACA	1350	1	2	2.1	0.0	1390	0	2	0	8.2	0.7
AEA	328	1	100	2.2	-0.2	331	0	5	0	10.7	1.6
AEL	509	1	3	2.2	-0.8	516	1	3	0	9.7	1.0
AEY	34	0	0	1.4	0.8	35	0	0	0	6.8	0.0
AFL	116	0	0	1.8	0.5	117	0	1	0	8.9	0.1
AFR	1051	0	5	1.9	0.1	1075	0	6	0	9.4	1.0
AIC	24	13	13	2.4	-0.6	24	0	13	0	15.1	-3.6
AIH	121	2	2	2.0	-0.1	125	0	5	0	7.8	0.8
AJM	44	0	2	2.1	-1.0	47	0	2	0	10.3	1.2
AMX	153	1	7	2.3	-0.6	155	0	7	0	9.4	0.7
ANZ	216	0	1	2.3	-1.1	218	1	3	0	8.3	0.2
AOM	214	1	3	1.8	1.0	224	0	3	0	8.1	1.2
ATN	52	0	8	2.8	-2.3	52	0	100	0	22.5	5.7
AUA	41	0	2	1.7	-0.2	42	0	2	0	8.3	0.8
AVA	111	0	4	2.4	-0.1	116	0	3	0	9.9	0.3
AZA	508	1	8	2.2	0.6	516	0	7	0	9.8	0.9
BAL	301	1	20	2.1	-0.2	316	0	21	0	8.3	0.3
BAW	1337	0	4	2.1	-0.1	1343	0	4	0	8.5	0.9
BWA	117	1	45	2.7	1.9	124	1	10	0	9.3	1.2
CDN	387	0	1	1.9	-0.1	390	0	1	0	7.7	1.2
CFC	41	0	22	2.5	0.3	46	0	26	0	7.2	-2.0
CFG	657	0	3	2.2	-1.0	687	0	2	0	8.5	0.4
CKS	23	0	70	2.9	-0.1	23	0	70	0	13.6	-0.2
CKT	52	0	10	1.8	0.5	54	0	4	0	7.6	0.1
CLX	291	1	2	2.1	-0.5	295	0	2	0	8.6	0.9
CMM	22	5	9	1.7	0.4	22	0	14	0	13.9	0.1
COA	398	2	3	1.8	0.9	409	0	5	0	10.3	0.9
CRL	239	0	3	2.0	0.3	249	1	3	0	9.3	0.6
CUB	219	1	6	1.9	1.1	226	0	100	0	11.3	2.2
DAF	21	0	0	2.9	-1.2	21	0	0	0	8.1	-0.6
DAL	2643	1	2	2.1	0.3	2665	0	3	0	9.5	0.7
DHL	291	2	100	3.3	-1.3	296	0	100	0	12.6	0.8
DLH	2753	0	8	2.0	0.4	2768	0	9	1	8.4	0.6
DOA	29	0	0	2.9	-0.2	29	0	3	0	10.4	1.5
EIN	30	3	17	2.3	1.0	29	0	17	0	14.0	0.6
ELN	21	0	5	1.8	0.7	21	0	29	0	22.0	1.8
ELY	106	1	8	1.9	0.3	113	0	10	0	10.0	0.1
EWW	164	1	5	2.7	1.0	169	1	100	0	18.1	3.5
FDX	468	1	4	2.0	0.6	476	0	4	0	8.4	1.1
FIN	298	0	2	1.9	0.4	296	0	4	1	10.0	0.3
GAF	91	2	4	2.7	1.0	93	0	3	0	7.7	1.0
HLF	118	3	4	1.7	-0.8	124	1	71	0	8.5	1.2
IBE	1272	1	23	2.3	0.3	1286	0	25	0	10.2	1.5
ICE	610	0	1	1.9	-0.1	609	0	3	0	8.8	0.7
JAL	26	0	0	1.3	0.3	26	0	0	0	8.4	2.2
KLM	2020	0	2	2.1	0.3	2034	0	3	0	9.2	0.8
LDA	167	1	10	2.2	-0.7	172	0	10	0	10.1	0.9
LDI	321	1	25	2.1	-1.1	328	1	27	0	9.5	0.9
LIB	99	1	3	1.9	1.0	106	0	3	0	9.0	1.1
LOT	288	1	3	2.6	-1.2	288	0	3	0	9.6	0.7
LTU	661	1	4	1.9	0.0	665	0	6	0	10.0	1.2
MPH	543	0	1	2.0	-0.7	553	0	2	0	8.4	0.7
NWA	2103	0	2	2.2	0.9	2167	0	2	0	8.9	0.6
PIA	24	4	8	1.8	0.3	24	0	8	0	10.5	1.9
RAM	25	0	0	2.7	-0.6	25	0	4	0	12.8	-1.2
RCH	229	5	100	3.4	0.2	223	1	100	0	13.8	-0.4
RJA	64	0	2	1.8	0.5	67	0	3	0	10.8	-1.1
RRR	96	3	19	2.6	-0.3	96	0	22	1	10.6	0.7

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
SAB	47	0	2	1.8	0.2	48	0	0	0	7.7	1.3
SAS	888	0	2	1.9	0.4	891	0	2	0	9.1	0.4
SEU	29	0	7	2.5	-1.3	31	0	6	0	6.4	1.7
SIA	107	0	7	2.0	-0.7	109	0	7	0	8.4	-0.2
SLR	49	0	33	1.6	-0.2	52	0	33	0	8.9	-0.4
SPP	171	0	10	1.9	-0.2	162	0	15	0	10.1	1.4
SVA	119	1	9	2.3	0.4	124	0	100	0	13.3	2.7
SWR	171	1	2	1.6	0.1	175	0	3	0	8.0	1.8
TAP	254	2	10	2.4	0.4	254	0	7	0	8.8	1.4
TEJ	61	0	26	2.1	0.5	64	0	23	0	9.2	2.1
THY	30	0	20	4.5	3.7	35	0	31	0	15.3	6.1
TOW	80	0	6	2.2	0.1	82	1	11	0	10.4	1.2
TWA	1203	1	2	2.1	0.1	1200	0	3	0	9.5	1.7
TWE	25	0	8	3.4	1.7	25	0	0	0	7.0	-1.1
UAL	1929	0	2	2.1	-0.7	1956	0	2	0	8.3	0.2
ULE	156	1	3	2.1	0.8	163	0	4	0	10.7	0.4
UPS	504	0	16	2.0	0.3	519	0	17	0	8.6	1.4
USA	461	1	2	1.9	-0.1	461	0	4	0	10.5	1.1
VIR	260	0	2	2.0	-0.4	262	0	3	0	8.2	1.3
BA	8036	2	14	1.7	0.5	8036	0	12	0	7.6	1.1
IT	22	0	0	0.7	-0.4	22	0	0	0	3.7	0.0
KL	3400	1	11	1.5	0.3	3401	0	10	0	7.5	1.0
LH	366	5	9	1.8	0.2	365	0	9	0	6.2	0.4
N	292	2	100	3.2	0.8	308	0	5	0	10.3	0.2

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: March, 1997

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	00	Z	100	19	0	15.6	23.0	17.0
DBBH	12	Z	100	16	0	13.3	30.9	27.9
DBLK	00	Z	100	1	0	0.0	75.0	75.0
DXXOAD	00	Z	100	1	0	0.0	19.0	19.0
DXXOAD	12	Z	100	3	0	22.1	33.4	25.0
EHOA	00	Z	100	1	0	0.0	20.0	20.0
EHOA	12	Z	100	4	0	10.8	37.8	36.3
FNOR	00	Z	100	12	0	11.4	30.1	27.8
FNOR	12	Z	100	13	0	10.3	21.1	18.5
FNOU	00	Z	100	10	0	16.6	27.3	21.6
FNOU	12	Z	100	11	0	17.4	24.9	17.8
FNPH	00	Z	100	11	0	15.0	18.5	10.7
FNPH	12	Z	100	10	0	13.2	14.8	6.6
FNRS	00	Z	100	15	0	14.4	17.7	10.2
FNRS	12	Z	100	14	0	16.0	18.9	10.1
JCCX	00	Z	100	1	0	0.0	52.0	52.0
KCEJ	00	Z	100	6	0	29.0	56.6	48.7
KCEJ	12	Z	100	4	0	20.2	70.9	68.0
LDWR	00	Z	100	31	0	19.5	27.0	18.7
LDWR	12	Z	100	28	0	18.6	20.6	8.9
OXTS2	00	Z	100	14	0	58.6	59.5	10.2
OXTS2	12	Z	100	15	0	14.3	25.1	20.7
OXYH2	00	Z	100	19	0	23.7	26.9	12.8
OXYH2	12	Z	100	19	0	21.1	34.3	27.1
SHIP	00	Z	100	1	0	0.0	81.0	81.0
SHIPAF	00	Z	100	1	0	0.0	13.0	-13.0
V2EZ	00	Z	100	8	0	14.3	41.5	39.0
V2EZ	12	Z	100	6	0	19.3	31.3	24.7
V2GH	00	Z	100	10	0	18.5	18.7	-3.0
V2GH	12	Z	100	9	0	23.4	26.0	11.2
V2LV	00	Z	100	27	0	16.9	26.1	19.9
V2LV	12	Z	100	25	0	21.0	29.2	20.4
WTEU	00	Z	100	1	0	0.0	7.0	7.0
XXOA	00	Z	100	1	0	0.0	10.0	-10.0
XXOA	12	Z	100	3	0	16.9	17.0	2.0
ZDLG	00	Z	100	1	0	0.0	13.0	13.0
03953	00	Z	100	31	0	15.8	22.0	15.3
03953	12	Z	100	29	0	15.8	17.7	7.9
04018	00	Z	100	29	0	16.6	51.8	49.0
04018	12	Z	100	30	0	19.4	59.5	56.2
04220	00	Z	100	29	0	19.0	41.8	37.2
04220	12	Z	100	30	0	14.1	40.7	38.2
04270	00	Z	100	27	0	26.3	47.1	39.0
04270	12	Z	100	28	0	23.0	37.8	30.0
04339	00	Z	100	29	0	17.8	39.8	35.6
04339	12	Z	100	29	0	19.0	46.8	42.7
04360	00	Z	100	28	0	20.6	30.3	22.2
04360	12	Z	100	30	0	13.9	24.2	19.8
08001	00	Z	100	30	0	12.4	16.5	10.9
08001	12	Z	100	28	0	12.4	12.8	3.0
08508	00	Z	100	30	0	15.8	29.6	25.0
08508	12	Z	100	31	0	47.8	48.7	9.2
08522	00	Z	100	31	0	13.5	20.6	15.6
08522	12	Z	100	31	0	10.7	11.4	4.0
60020	00	Z	100	30	0	22.8	35.6	27.3
60020	12	Z	100	31	0	12.4	22.3	18.5
71600	00	Z	100	29	0	15.1	29.9	25.8
71600	12	Z	100	31	0	14.9	23.5	18.1
72201	00	Z	100	23	0	31.7	53.8	43.4
72201	12	Z	100	30	0	17.9	51.4	48.1
72402	00	Z	100	26	0	21.3	27.0	16.5
72402	12	Z	100	28	0	18.5	27.2	20.0
74494	00	Z	100	11	0	19.8	23.5	12.5
74494	12	Z	100	15	0	12.1	45.0	43.3
78016	12	Z	100	29	0	16.1	28.3	23.3

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: March, 1997

Monitoring procedures:

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :0°N - 90°N, 100°W - 40°E

Standard of comparison :Background field from Bracknell global model.

Position :Average latitude and longitude for period.

Observation times :00, 12 UTC.

Level monitored :500 hPa.

Element monitored :GEOPOTENTIAL HEIGHT in metres

Parameters monitored

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period.

:SD :SD of difference of observations from background values at level shown excluding those with gross errors.

:BIAS :Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	00	Z	500	19	0	5.8	5.8	-0.1
DBBH	12	Z	500	19	1	7.0	7.1	1.1
DBLK	00	Z	500	1	0	0.0	23.0	23.0
DXXOAD	00	Z	500	1	0	0.0	22.0	-22.0
DXXOAD	12	Z	500	5	0	12.9	13.0	1.4
EHOA	00	Z	500	1	0	0.0	1.0	-1.0
EHOA	12	Z	500	9	0	13.4	28.0	24.6
EHOI	00	Z	500	1	0	0.0	29.0	29.0
FNOR	00	Z	500	12	0	10.6	22.5	19.8
FNOR	12	Z	500	13	0	17.0	32.4	27.5
FNOU	00	Z	500	11	0	14.0	24.8	20.5
FNOU	12	Z	500	12	0	11.0	21.0	17.8
FNPH	00	Z	500	11	0	10.2	11.8	5.9
FNPH	12	Z	500	10	0	12.9	17.4	11.6
FNRS	00	Z	500	15	0	14.5	14.9	3.4
FNRS	12	Z	500	14	0	11.3	15.4	10.6
JCCX	00	Z	500	1	0	0.0	8.0	8.0
KCEJ	00	Z	500	8	0	12.3	20.6	16.5
KCEJ	12	Z	500	9	0	14.3	15.2	5.1
LDWR	00	Z	500	31	0	13.3	27.4	24.0
LDWR	12	Z	500	28	0	19.5	25.5	16.3
OXTS2	00	Z	500	17	0	11.5	16.0	11.2
OXTS2	12	Z	500	15	0	14.6	17.8	10.2
OXYH2	00	Z	500	21	0	22.6	23.9	7.7
OXYH2	12	Z	500	21	0	22.8	24.4	8.6
SHIP	00	Z	500	1	0	0.0	22.0	22.0
SHIP	12	Z	500	1	0	0.0	4.0	4.0
SHIPAF	00	Z	500	1	0	0.0	23.0	23.0
V2EZ	00	Z	500	10	0	9.2	20.4	18.2
V2EZ	12	Z	500	8	0	15.9	21.2	14.0
V2GH	00	Z	500	15	0	17.5	17.7	2.0
V2GH	12	Z	500	13	0	20.3	20.5	2.9
V2LV	00	Z	500	29	0	11.2	16.9	12.6
V2LV	12	Z	500	29	0	14.9	19.6	12.7
WTEU	00	Z	500	1	0	0.0	9.0	-9.0
XXOA	00	Z	500	1	0	0.0	4.0	-4.0
XXOA	12	Z	500	4	0	13.9	14.8	-5.0
ZDLG	00	Z	500	1	0	0.0	7.0	7.0
03953	00	Z	500	31	0	11.6	22.8	19.6
03953	12	Z	500	31	0	9.3	20.1	17.8
04018	00	Z	500	30	0	16.6	38.2	34.3
04018	12	Z	500	31	0	16.3	33.4	29.2
04220	00	Z	500	30	0	23.7	24.7	7.1
04220	12	Z	500	30	0	18.3	19.6	7.1
04270	00	Z	500	27	0	24.6	35.5	25.6
04270	12	Z	500	28	0	15.5	23.9	18.1
04339	00	Z	500	30	0	19.2	25.6	17.0
04339	12	Z	500	30	0	15.3	22.3	16.2
04360	00	Z	500	28	0	14.8	21.7	15.9
04360	12	Z	500	30	0	14.5	19.0	12.2
08001	00	Z	500	31	0	10.5	17.1	13.5
08001	12	Z	500	30	0	8.1	11.2	7.7
08508	00	Z	500	30	0	13.8	24.6	20.4
08508	12	Z	500	31	0	17.4	23.3	15.5
08522	00	Z	500	31	0	12.7	21.9	17.9
08522	12	Z	500	31	0	12.3	21.1	17.1
60020	00	Z	500	30	0	17.4	31.0	25.6
60020	12	Z	500	31	0	8.9	26.5	24.9
71600	00	Z	500	29	0	19.5	21.6	9.3
71600	12	Z	500	31	0	11.0	16.7	12.6
72201	00	Z	500	27	0	9.0	19.3	17.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
72201	12	Z	500	31	0	8.7	12.8	9.4
72402	00	Z	500	30	0	15.5	15.6	-1.6
72402	12	Z	500	30	0	9.8	10.5	3.6
74494	00	Z	500	28	0	12.3	15.2	9.0
74494	12	Z	500	31	0	16.2	17.9	7.6
78016	12	Z	500	30	0	13.0	16.9	10.8

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: March, 1997

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	00	V	100	17	0	0	3.2	3.0	-2.9
DBBH	12	V	100	16	0	0	6.0	0.6	0.9
DBLK	00	V	100	1	0	0	4.3	0.2	2.0
EHOA	00	V	100	1	0	0	4.5	-10.5	-0.2
EHOA	12	V	100	4	0	0	4.5	-2.9	0.4
FNOR	00	V	100	12	0	0	4.5	-1.2	-3.3
FNOR	12	V	100	12	0	0	4.1	-1.5	-2.9
FNOU	00	V	100	10	0	0	4.2	-1.6	-0.4
FNOU	12	V	100	11	0	0	2.9	-1.0	-0.2
FNPH	00	V	100	11	0	0	2.6	-1.6	0.1
FNPH	12	V	100	9	0	0	2.6	-2.1	-0.7
FNRS	00	V	100	12	0	0	2.6	1.3	-0.2
FNRS	12	V	100	14	0	0	5.1	0.1	-1.2
JCCX	00	V	100	1	0	0	5.8	1.2	1.5
KCEJ	00	V	100	3	0	0	5.8	-1.7	5.3
KCEJ	12	V	100	3	0	0	5.8	0.0	7.5
LDWR	00	V	100	30	0	0	5.8	-0.9	-2.7
LDWR	12	V	100	28	0	0	3.3	-1.3	-3.0
OXTS2	00	V	100	13	0	0	2.6	-1.7	-1.1
OXTS2	12	V	100	13	0	0	2.9	-1.6	-0.8
OXYH2	00	V	100	19	0	0	2.3	-0.4	0.5
OXYH2	12	V	100	18	0	0	2.8	-1.4	1.6
SHIP	00	V	100	1	0	0	2.0	-3.9	3.7
V2EZ	00	V	100	8	0	0	3.1	1.5	-0.1
V2EZ	12	V	100	5	0	0	3.1	-2.5	-0.4
V2GH	00	V	100	10	0	0	3.1	0.6	-0.5
V2GH	12	V	100	9	0	0	2.0	1.0	0.2
V2LV	00	V	100	28	0	0	2.0	1.0	-1.1
V2LV	12	V	100	25	0	0	3.9	-0.7	-0.2
WTEU	00	V	100	1	0	0	2.6	-0.4	1.3
XXOA	00	V	100	1	0	0	2.6	-0.6	3.1
ZDLG	00	V	100	1	0	0	2.6	1.1	4.1
03953	00	V	100	31	0	0	3.7	-0.2	-0.3
03953	12	V	100	29	0	0	2.4	-1.9	-0.6
04018	00	V	100	29	0	0	2.9	-1.4	-1.4
04018	12	V	100	30	0	0	2.7	-2.2	-0.6
04220	00	V	100	29	0	0	3.3	0.0	0.9
04220	12	V	100	30	0	0	1.7	-1.1	0.9
04270	00	V	100	27	0	0	1.9	-0.3	1.2
04270	12	V	100	28	0	0	4.7	-1.7	1.3
04339	00	V	100	27	0	0	1.5	-0.9	-0.1
04339	12	V	100	29	0	0	2.1	-1.0	0.0
04360	00	V	100	28	0	0	3.2	-1.3	0.6
04360	12	V	100	30	0	0	2.1	-2.4	0.3
08001	00	V	100	27	0	0	2.6	0.7	0.5
08001	12	V	100	28	0	0	2.5	-0.8	0.8
08508	00	V	100	31	0	0	2.5	1.7	-0.8
08508	12	V	100	31	0	0	3.1	-1.0	-1.5
08522	00	V	100	31	0	0	2.6	1.6	-0.9
08522	12	V	100	30	0	0	2.7	-0.5	-0.2
60020	00	V	100	29	0	0	3.3	2.4	-1.4
60020	12	V	100	30	0	0	3.5	-0.2	-0.5
71600	00	V	100	29	0	0	3.9	-0.2	0.9
71600	12	V	100	31	0	0	3.5	-0.1	1.7
72201	00	V	100	23	0	0	3.2	0.3	0.4
72201	12	V	100	30	0	0	5.1	0.3	0.4
72402	00	V	100	26	0	0	2.1	0.0	-0.2
72402	12	V	100	28	0	0	3.9	-0.3	-0.6
74494	00	V	100	11	0	0	3.7	1.1	2.4
74494	12	V	100	14	0	0	5.0	1.0	1.1
78016	12	V	100	29	0	0	5.9	-0.6	-1.3

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: March, 1997

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period.
	:UBIAS,VBIAS:	Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	00	V	500	20	0	0	3.2	0.7	0.4
DBBH	12	V	500	20	0	5	2.9	-0.5	2.0
DBLK	00	V	500	1	0	0	2.8	-2.6	2.5
DXXOAD	12	V	500	3	0	0	4.0	-3.3	-1.3
EHOA	00	V	500	1	0	0	4.0	-5.1	0.2
EHOA	12	V	500	6	0	16	4.0	-0.3	0.1
EHOI	00	V	500	1	0	100	4.0	0.9	-7.6
FNOR	00	V	500	12	0	0	4.0	-0.8	-0.4
FNOR	12	V	500	13	0	7	2.5	-0.7	-1.5
FNOU	00	V	500	11	0	0	5.2	0.5	0.8
FNOU	12	V	500	12	0	0	2.0	-1.0	0.4
FNPH	00	V	500	11	0	0	4.6	-0.2	-0.5
FNPH	12	V	500	10	0	0	2.9	-1.4	1.1
FNRS	00	V	500	13	0	0	3.0	-1.0	-1.0
FNRS	12	V	500	14	0	0	2.8	-1.4	-0.8
JCCX	00	V	500	1	0	0	3.7	-2.9	-0.6
KCEJ	00	V	500	8	0	0	3.7	-0.5	2.9
KCEJ	12	V	500	9	0	0	3.4	0.0	3.1
LDWR	00	V	500	31	0	0	3.9	-0.1	-0.5
LDWR	12	V	500	28	0	0	4.1	0.5	-1.2
OXTS2	00	V	500	16	0	0	4.1	-0.4	0.7
OXTS2	12	V	500	14	0	0	4.6	-0.7	-0.4
OXYH2	00	V	500	21	0	0	4.6	0.5	2.2
OXYH2	12	V	500	20	0	0	5.6	-1.3	-1.1
SHIP	00	V	500	1	0	0	3.6	3.4	-2.7
SHIP	12	V	500	1	0	0	3.6	10.3	-3.2
SHIPAF	00	V	500	1	0	100	3.6	-16.7	-4.9
V2EZ	00	V	500	10	0	0	1.4	-0.2	1.2
V2EZ	12	V	500	7	0	0	3.1	-0.4	-2.7
V2GH	00	V	500	14	0	0	3.1	0.1	-0.6
V2GH	12	V	500	13	0	0	3.6	-1.2	0.4
V2LV	00	V	500	30	0	0	2.0	1.0	-0.3
V2LV	12	V	500	29	0	0	3.7	-0.7	-0.1
WTEU	00	V	500	1	0	0	2.6	-1.0	0.3
XXOA	00	V	500	1	0	0	2.6	-3.3	3.2
XXOA	12	V	500	2	0	0	2.6	5.1	1.0
ZDLG	00	V	500	1	0	0	2.6	4.9	5.9
03953	00	V	500	31	0	0	3.1	0.6	-0.9
03953	12	V	500	31	0	0	3.2	-0.5	-1.1
04018	00	V	500	30	0	0	2.9	1.0	0.4
04018	12	V	500	31	0	0	3.6	1.0	0.6
04220	00	V	500	29	0	0	5.6	-0.6	0.9
04220	12	V	500	30	0	0	3.8	0.8	0.9
04270	00	V	500	27	0	0	3.8	0.7	-0.3
04270	12	V	500	28	0	0	4.6	1.8	0.2
04339	00	V	500	30	0	0	4.1	2.9	0.4
04339	12	V	500	29	0	0	5.2	2.3	0.2
04360	00	V	500	27	0	0	3.7	0.0	0.6
04360	12	V	500	30	0	0	4.6	-0.3	0.2
08001	00	V	500	31	0	0	3.2	1.0	-0.8
08001	12	V	500	30	0	0	2.5	-0.4	-1.4
08508	00	V	500	29	0	0	3.2	1.1	-0.5
08508	12	V	500	31	0	0	4.0	0.4	-1.3
08522	00	V	500	31	0	0	3.7	-0.3	0.9
08522	12	V	500	31	0	0	3.3	-0.4	0.4
60020	00	V	500	30	0	0	3.0	-0.2	-0.6
60020	12	V	500	31	0	0	3.1	-1.3	0.1
71600	00	V	500	29	0	0	4.5	1.2	-0.8
71600	12	V	500	31	0	0	3.9	0.5	-0.1
72201	00	V	500	27	0	0	3.0	-0.3	1.4
72201	12	V	500	31	0	0	3.1	0.0	0.9

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
72402	00	V	500	30	0	0	2.3	1.9	0.5
72402	12	V	500	30	0	0	4.2	-0.4	-0.3
74494	00	V	500	28	0	0	3.6	0.2	0.4
74494	12	V	500	31	0	0	3.2	-0.2	0.6
78016	12	V	500	30	0	0	3.5	-1.7	1.3

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45